

SR 303L, LITCHFIELD ROAD TRAFFIC INTERCHANGE  
MAG PROJECT NO. 0600-0110-17-E003-0780-0K.000008

# FINAL PROJECT ASSESSMENT

APRIL 2019

*Prepared For:*



*Prepared By:*



1230 W. WASHINGTON STREET, SUITE 405  
TEMPE, ARIZONA 85281  
PH (480) 996-8295



EXPIRES 09/30/21

## TABLE OF CONTENTS

<b>A. Introduction.....</b>	<b>4</b>
<b>B. Background Data.....</b>	<b>4</b>
Roadway.....	5
Traffic .....	6
Structures and Walls.....	8
Drainage .....	8
Geotechnical.....	10
Utilities .....	10
Right-of-Way.....	10
<b>C. Alternative Analysis.....</b>	<b>11</b>
<b>D. Project Scope.....</b>	<b>12</b>
Roadway.....	12
Traffic .....	13
Drainage .....	13
Structures and Walls.....	14
<b>E. Project Development Considerations .....</b>	<b>15</b>
Other Projects in the Vicinity .....	15
Agency and Public Coordination .....	16
Environmental Overview .....	16
<b>F. Other Requirements .....</b>	<b>18</b>
<b>G. Estimated Cost.....</b>	<b>19</b>
<b>H. Required Action by the Priority Planning Action Committee (PPAC) and/or Project Review Board (PRB) .....</b>	<b>20</b>
<b>I. Involvement Sheet.....</b>	<b>20</b>

Appendix A: Vicinity Map

Appendix B: Alternative Evaluation Matrix

Appendix C: Project Photos

Appendix D: Typical Sections

Appendix E: Stage I (15%) Plans

Appendix F: Estimated Project Cost

Appendix G: Limited Geotechnical Evaluation Report

Appendix H: Planning and Environmental Linkages (PEL) Questionnaire and Checklist

## LIST OF FIGURES

Figure 1: Peak Hour Volumes .....	7
Figure 2: Proposed Bridge Typical Section .....	14

## LIST OF TABLES

Table 1: Previous Projects .....	4
Table 2: Existing SR 303L Horizontal Alignment .....	5
Table 3: Existing SR 303L Vertical Alignment .....	5
Table 4: Traffic Volumes .....	6
Table 5: Traffic Factors .....	6
Table 6: Operational Analysis – Intersections .....	8
Table 7: Operational Analysis – Freeway .....	8
Table 8: List of Existing Cross Culverts Under SR 303L.....	9
Table 9: Existing Utilities .....	10
Table 10: Existing Right of Way .....	11
Table 11: Adjacent ADOT Projects.....	15
Table 12: Projects Referenced for Unit Costs .....	19
Table 13: Estimated Project Cost.....	19

## **A. INTRODUCTION**

Maricopa Association of Governments (MAG) Project No. 0600-0110-17-E003-0780-0K.000008, is assigned to the State Route 303 Loop (SR 303L), Litchfield Road Traffic Interchange (TI) Project. This project will study the potential to add a new traffic interchange (TI) on SR 303L in Maricopa County, Arizona. Project limits extend from SR 303L milepost (MP) 121.76 to MP 123.10.

The proposed Litchfield Road TI is located at MP 122.5 on SR 303L, approximately three miles east of the interchange at US 60 and approximately one mile west of the interchange at El Mirage Road. SR 303L is a controlled access freeway connecting the I-10 to US 60 and I-17. The corridor runs through the northwest region of the Phoenix Metropolitan Area. A Vicinity Map is provided in Appendix A.

Funding for design and construction of this potential proposed project has not yet been identified. This Project Assessment (PA) is being developed following ADOT's guidelines to ensure this proposed project is positioned to move forward if funding becomes available.

The purpose of the proposed project is to improve access and regional circulation north of the SR 303L facility. Existing development south of SR 303L has access via US 60 or El Mirage Road as El Mirage Road does not extend north of SR 303L. All development north of SR 303L has access at US 60 via 163<sup>rd</sup> Ave or at Happy Valley Parkway. A new interchange at SR 303L and Litchfield Road would relieve traffic from the surrounding roadway network that is quickly approaching capacity, including the intersection of 163<sup>rd</sup> Ave and US 60.

The preliminary construction cost estimate for the proposed project is approximately \$28,200,000 in current year dollars.

## **B. BACKGROUND DATA**

Within the project limits, SR 303L exists as an interim six-lane facility where three general purpose lanes in each direction are separated by a median barrier. The ultimate facility will include four general purpose lanes and one High Occupancy Vehicle (HOV) lane (4+1). SR 303L is designated a northbound/southbound highway; however, within the project limits, the roadway primarily travels west and east.

The project area consists of level terrain with an average elevation of 1,310 feet.

ADOT Engineering Records indicates the previous projects within the area as listed in Table 1.

*Table 1: Previous Projects*

<b>Project No.</b>	<b>Begin MP</b>	<b>End MP</b>	<b>Project Limits</b>	<b>Description</b>	<b>As-Built Date</b>
AC-NH-303-A(220)T	119	125	US 60 – Happy Valley Pkwy	Reconstruct and Widen Pavement	07/29/15
NH-303-A(210)S	118	120	US 60/SR 303L Interim TI	Construct New TI	12/28/16
NH-303-A(215)T	123.01	124.01	El Mirage Road TI	Construct New TI	12/19/16
RARF-303-A-NFRA	118	122	I-10/SR 303L TI	Landscape and Irrigation	04/01/17

## Roadway

SR 303L is classified as a Controlled-Access Highway. The existing speed limit is 65 mph. The cross section includes three 12-foot lanes in each direction, 12-foot inside and outside shoulders, and median barrier. There is no existing curb and gutter, barrier, or guardrail in the project limits.

Litchfield Road currently does not exist north of SR 303L. A study conducted in 2011 as part of the SR 303L preliminary engineering (ADOT Project No. H6896) evaluated various locations for a new TI to be constructed between US 60 and El Mirage Road. Seven locations were evaluated. Four concepts were deemed to have fatal flaws and were eliminated. The remaining three alternative locations were further evaluated and the study concluded that the optimal location was between US 60 and El Mirage Road at approximately MP 122.5 on SR 303L. The study also recommended that the new Litchfield Road cross over SR 303L to avoid freeway reconstruction.

The proposed Litchfield Road TI intercepts SR 303L within an existing reverse curve alignment. Along the length of the proposed TI, the existing SR 303L cross slope transitions between  $\pm 4\%$  superelevated and 2% crowned cross slopes. SR 303L existing geometry and cross slopes were obtained from Project No. AC-NH-303-A(220)T record drawings. See Table 2 for the existing horizontal alignment and Table 3 for the existing vertical alignments, respectively.

*Table 2: Existing SR 303L Horizontal Alignment*

Beginning Station	Ending Station	Alignment Type	Super Elevation (%)
1247+18.29	1271+13.52	Tangent	NC
1271+13.52	1284+73.61	Dc=1°25'57" Curve	4.0
1284+73.61	1296+45.49	Tangent	NC
1296+45.49	1310+33.01	Dc=1°25'57" Curve	4.0
1310+33.01	1391+56.00	Tangent	NC

*Table 3: Existing SR 303L Vertical Alignment*

VPI Station	Grade In (%)	Grade Out (%)	Curve Length (Ft)	Curve Type
<b>Northbound</b>				
1261+50	-0.40	+0.40	800	Sag
1271+50	+0.40	-0.45	800	Crest
1289+00	-0.45	+0.40	800	Sag
1297+60	+0.40	-0.41	800	Crest
<b>Southbound</b>				
1262+55	-0.40	+0.36	800	Sag
1271+65	+0.36	-0.45	800	Crest
1288+00	-0.45	+0.40	800	Sag
1298+30	+0.40	-0.43	800	Crest

## Traffic

Vehicular access to and from SR 303L is limited in the vicinity of this proposed project, highlighting the need for an additional TI to provide access to the north of the freeway. The US 60 TI provides access to both sides of SR 303L and is three miles west of the proposed Litchfield TI. The El Mirage TI is one mile east of the proposed Litchfield TI but only serves traffic to the south of SR 303L. The City of Surprise and City of Peoria indicated that they do expect it to eventually provide access to the north, but that is likely many years in the future due to various utility and access constraints. The Happy Valley Parkway TI is approximately 3 miles east of the proposed Litchfield TI and it provides access to both sides of SR 303L. This results in a six-mile gap between access points to SR 303L from the north, which puts additional strain on the existing TIs.

The Rancho Mercado development is located north of SR 303L, and while the Litchfield Road TI was not considered when the Traffic Impact Analysis (TIA) was completed, it is expected that traffic to and from that development will heavily utilize the new proposed interchange. The City of Surprise indicated that the intersection of 163rd Ave and US 60 level of service (LOS) is approaching failing. A developer is extending Happy Valley Road to the east, and when this happens, LOS on the Happy Valley Road/SR 303L TI, which was constructed in 2011, is anticipated to also fail. The new proposed TI at Litchfield Road is expected to relieve these failing intersections and interchanges.

Table 4 shows the most recently available volumes used to represent existing conditions (2017) on SR 303L as presented by the ADOT Transportation Data Management System (TDMS). The City of Surprise coordinated with MAG to provide the design year (2035) projected traffic volumes in the project vicinity, also shown in Table 4.

*Table 4: Traffic Volumes*

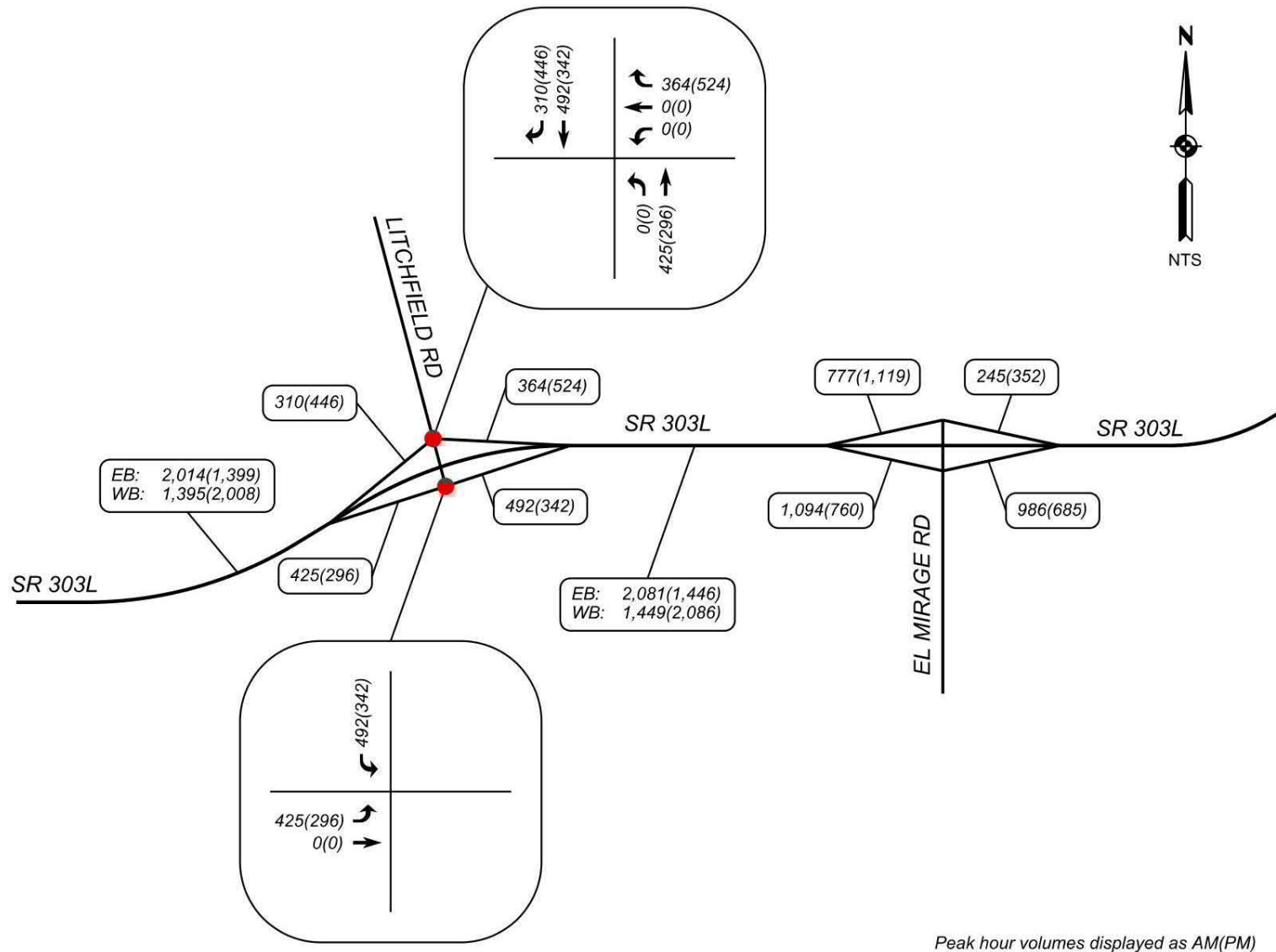
Segment	2017		2035	
	Eastbound	Westbound	Eastbound	Westbound
SR 303L: US 60 to Litchfield Rd	6,962	7,358	34,131	34,034
SR 303L: Litchfield Rd to El Mirage Rd	6,962	7,358	35,263	35,349
Off Ramp to Litchfield Rd	-	-	7,209	8,879
On Ramp from Litchfield Rd	-	-	8,340	7,564
Off Ramp to El Mirage Rd	926	3,263	18,545	5,971
On Ramp from El Mirage Rd	3,417	899	16,717	18,959

As the above volumes are for a 24-hour period, K, D, and T factors were obtained from the ADOT Multimodal Planning Division (MPD) website, as shown in Table 5, and applied to obtain the 2035 peak-hour volumes, as shown in Figure 1.

*Table 5: Traffic Factors*

Segment	K Factor (Design Hour)	D Factor (Directional Distribution)	T Factor (Truck and RV)
SR 303L: US 60 to El Mirage Rd	10	59	7

Figure 1: Peak Hour Volumes



The ADOT *Roadway Design Guidelines*, Table 103.2A, provides LOS and capacity performance thresholds for various Arizona State Highway classification and terrain conditions. The study area is classified as urban, which requires a LOS threshold of D or better.

The traffic operational analysis included evaluating the future intersection LOS and queueing using *Synchro/SimTraffic* as well as freeway weaving, merging, and diverging segments using *Highway Capacity Software (HCS)*. The interchange intersections were assumed to operate as all-way stop-controlled intersections. Results of the 2035 intersection and freeway operational analyses are presented in Table 6 and Table 7, respectively.

*Table 6: Operational Analysis – Intersections*

Intersection	Peak Hour	Delay (sec/veh)	LOS	95th Percentile Queue (ft)			
				EB	WB	NB	SB
Litchfield Rd & SR 303L WB Ramp	AM	11.7	B	-	101	23	-
	PM	11.9	B	-	113	22	-
Litchfield Rd & SR 303L EB Ramp	AM	14.6	B	83	-	-	73
	PM	10.5	B	67	-	-	67

*Table 7: Operational Analysis – Freeway*

Direction	Peak Hour	Merge <sup>1</sup>		Diverge <sup>2</sup>		Weave <sup>3</sup>	
		Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS
Westbound	AM	11.2	B	-	-	7.5	A
	PM	15.6	B	-	-	11.4	B
Eastbound	AM	-	-	15.2	B	11.3	B
	PM	-	-	11.0	B	7.4	A

<sup>1</sup> Includes the merging that occurs with the westbound on-ramp from Litchfield Rd

<sup>2</sup> Includes the diverging that occurs with the eastbound off-ramp to Litchfield Rd

<sup>3</sup> Weaving maneuvers caused by the auxiliary lanes between the Litchfield Rd and El Mirage Rd TIs.

Based on the operational analysis, the intersections as well as the freeway merge, diverge, and weave segments will all operate at LOS B in the 2035 design year, well above the required threshold of LOS D.

## Structures and Walls

An existing sound wall runs along the south side of the proposed project limits at a 26 foot south offset from the existing edge of pavement. The existing sound wall offset accommodates the SR 303L ultimate 4+1 configuration but it does not accommodate width needed for an auxiliary lane.

## Drainage

### Existing Off-Site Drainage

The drainage flow pattern for this section of SR 303L is generally from north to south. Major drainage features in the project vicinity consist of the McMicken Dam Outlet Channel which is a Flood Control District of Maricopa County (FCDMC) planned 6-mile long channel running from southwest to northeast obliquely parallel to SR 303L, and the Padelford Wash (Wash 11 East) (flowing from north to south). There are a total of four reinforced concrete box culvert (RCBC) crossings under SR 303L within the proposed project limits. Table 8 shows a list of existing crossing culverts per Project No. AC-NH-303-A(220)T record drawings. These existing RCBCs

were designed using the 50-year, 6-hour peak flows. The 100-year, 6-hour peak flow was used to evaluate the impact of the SR 303L at each RCBC.

*Table 8: List of Existing Cross Culverts Under SR 303L*

Culvert ID	Roadway Station	Culvert Size & Type	Length (ft)	Q <sub>50</sub> (cfs) <sup>1</sup>	Q <sub>100</sub> (cfs) <sup>1</sup>	Designed Q <sub>50</sub> (cfs) <sup>2</sup>
9	Sta 1277+44	2-10'X5' RCBC	208	78	100	10
10	Sta 1283+00	2-8'X5' RCBC	204	70	89	13
11	Sta 1294+49	2-10'X5' RCBC	178	84	108	54
12	Sta 1302+36	2-8'X5' RCBC	185	70	87	44

<sup>1</sup> Q<sub>50</sub> and Q<sub>100</sub> were based on HDR's 2009 Final Hydrology Report for Loop 303/White Tank ADMPU Area Hydrologic Analysis in Maricopa, Arizona.

<sup>2</sup> Design Q<sub>50</sub> were used based on Parsons Brinckerhoff's 2012 Initial Drainage Report for SR 303L, US 60 to Happy Valley Parkway (TRACS No. H6896 01D).

Within the proposed project limits two outfalls for off-site flows exist. They are an existing drainage channel through the Corte Bella Subdivision and the McMicken Dam Outlet Wash located just east of the El Mirage Road TI.

An existing detention basin is located just west of Corte Bella Subdivision, which accepts the off-site flows from Culverts #9 and #10, as well as the on-site flow from SR 303L (Sta 1269+00 to Sta 1288+92). This detention basin is bled off via a 24-inch pipe to an existing concrete-lined drainage channel located adjacent and south of this basin through the Corte Bella Subdivision.

The off-site flows from Culvert #11 and #12, as well as the on-site flow from SR 303L, drain into an area between SR 303L and the Corte Bella Subdivision, where the existing drainage ditches along south side of SR 303L drain these flows toward east into the McMicken Dam Outlet Wash just east of the El Mirage Road TI.

An existing collector channel (SB Channel) runs along the north side of SR 303L from approximately 500-feet east of the proposed Litchfield Road TI through the existing El Mirage Road TI drainage ditches, a detention basin, and cross culverts. Its outfall is the McMicken Dam Outlet Wash just east of the El Mirage Road TI, approximately 1.6 miles from the proposed Litchfield Road TI. This earthen channel collects off-site runoff from an area between the McMicken Dam Outlet Channel and SR 303L. A portion of on-site runoff from SR 303L also discharges into this channel.

#### Existing On-Site Drainage

Curb and gutter is not used to convey runoff in this section of SR 303L. Instead, concrete shoulders are used to allow on-site runoff to sheet flow off the SR 303L pavement. This runoff flows into either first flush basins, drainage channels, or roadside ditches along the toe of embankment. There is a sound wall along the south shoulder of SR 303L. Catch basins and storm drains along the wall barrier are used to collect runoff from Northbound SR 303L with storm drains which discharge the runoff into first flush basins. In the superelevated segment, on-site runoff draining towards the median is collected in catch basins along the median discharging the runoff into first flush basins or directly draining into the cross culverts. Besides using first flush basins, check dams in the bottom of drainage channels or roadside ditches are used to store the first flush of runoff for water quality improvement. The first flush is defined as the first 0.5-inch of direct runoff generated within ADOT Right-of-Way (R/W).

## Geotechnical

Geotechnical information for the project site is provided in Appendix G.

## Utilities

Existing utilities that lie within the proposed project area include underground and overhead electric, gas, and fiber. Blue Stake Arizona 811 inquiry resulted in the list of utilities presented in Table 9. The boundaries of the Arizona 811 inquiry extended into the residential neighborhoods to the south of SR 303L, resulting in utilities potentially being listed beyond the project limits. Exact locations of existing utilities within the project limits will need to be identified in final design and reviewed for potential conflicts.

*Table 9: Existing Utilities*

Owner	Type	Location
Arizona Dept. of Transportation-Maricopa	Culverts, Electric, Fiber, Gas, Irrigation, Lighting, Propane, Sewer, Storm Drain, Telephone, Traffic Signals, Water	SR 303L, spanning project limits
Arizona Public Service	Electric	Parallel to and approx. 500' north of SR 303L, and residential streets south of project limits
Cox Communications - Maricopa	CATV, Fiber	El Mirage Dr and residential streets south of project limits
CenturyLink	Coaxial, Fiber	El Mirage Dr and residential streets south of project limits
Epcor Water (USA) Inc.- Sun City	Sewer, Water	El Mirage Dr and residential streets south of project limits
Maricopa County Dept. of Transportation	Fiber	El Mirage Dr and residential streets south of project limits
Maricopa County Dept. of Transportation	Traffic Signals	El Mirage Dr and residential streets south of project limits
Southwest Gas	Gas	Residential streets south of project limits
Transwestern Pipeline Co. - Maricopa County	Gas	Appx 1,000' north of SR 303L parallel to McMicken Levee
US Western Area Power Admin.	Overhead Electric	Parallel to and appx 600' north of SR 303L
Salt River Project	Overhead Electric	Appx 1,100' north of SR 303L parallel to McMicken Levee

## Right-of-Way

The existing ADOT R/W is presented in Table 10.

On the north side of SR 303L, FCDMC owns the property north of Maricopa County Department of Transportation (MCDOT) property. There are three utility easements north of the proposed project limits. These include a 20-foot Arizona Public Service (APS) easement, 330-foot Salt River Project (SRP) Easement, and a 200-foot Western Area Power Authority (WAPA) easement.

Table 10: Existing Right of Way

Beginning MP	Ending MP	Width from Centerline	Adjacent Ownership
<b>North R/W Boundary</b>			
1247+18.29	1279+50.54	175'	Brent C. Collins Trust / MCDOT
1279+50.54	1293+00.00	160'	MCDOT
1293+00.00	1311+36.16	180'	MCDOT
1311+36.16	1337+66.06	170'	MCDOT
<b>South R/W Boundary</b>			
1247+18.29	1279+60.78	Varies	Flood Control District of Maricopa County
1279+60.78	1288+02.83	150'	Nelda Graham, RWP & SHE Family Trust, Kamila Anwarshah, Stephen/Patricia Woodford, Leonard Ernest/Luz Alvarez, Keip Vigus/Sandra Dee, Stacey McEnnan Living Trust
1288+02.83	1288+72.69	Varies	Stacey McEnnan Living Trust, Benjamin Serpas
1288+72.69	1300+63.27	175'	MCDOT
1300+63.27	1316+99.04	195'	MCDOT
1316+99.04	1342+52.82	180'	MCDOT

## C. ALTERNATIVE ANALYSIS

An alternative analysis was conducted as part of this project to evaluate the feasibility of four different TI configurations. All configurations provided access to only the north side of SR 303L. As indicated through stakeholder input, the Corte Bella residential community on the south side of SR 303L will not have access to the interchange and that is not anticipated to change in the future.

- Option 1 – Half Diamond TI
- Option 2 – Full Diamond TI
- Option 3 – Half Trumpet TI
- Option 4 – Full Trumpet TI

Project stakeholders developed evaluation criteria to consider in comparing the four alternatives. The Alternative Evaluation Matrix is provided in Appendix B. The project team included representatives from MAG, City of Surprise, City of Peoria, MCDOT, FCDMC, and ADOT.

The alternative analysis concluded that both Trumpet TI configurations (Options 3 and 4) had more disadvantages than the Diamond TI configurations (Options 1 and 2). These included significant visual, light pollution, and sound impacts to the adjacent Corte Bella community; more land disturbance and R/W acquisition; maintenance access concerns; need for multiple retaining walls and a full height abutment on the south side of the proposed bridge; safety concerns with the loop ramp; and the need for design variances.

Traffic safety was favored in both Diamond TI alternatives (Options 1 and 2) as they do not present the higher speed differentials typically observed with loop ramp configurations. Due to the greater spacing from the Corte Bella community, the Diamond TI alternatives did not introduce as significant of perceived impacts than those of the Trumpet TI alternatives. Less R/W and fewer retaining walls are required for the Diamond TI configurations and both options also allow a bridge that would accommodate the ultimate 4+1 configuration without the use of full height abutments.

Projected 2035 traffic volumes are similar for both the northbound and southbound SR 303L directions, and all four ramps of the proposed Litchfield TI are expected to experience near-equal volumes. This indicates that a half interchange would fall short of providing adequate access to SR 303L. The adjacent interchanges, which are already at or near capacity, would still need to carry the additional traffic that would have otherwise used the proposed Litchfield TI. Therefore, based on traffic demand, access, and circulation, a full interchange configuration was desired.

After all alternatives were considered, the Full Diamond interchange (Option 2) was selected as the preferred configuration and was advanced to 15% design for this PA.

#### **D. PROJECT SCOPE**

The proposed Litchfield Road TI would be a full diamond configuration providing access to the north only. Litchfield Road would cross over SR 303L.

Below is a summary of the anticipated scope elements for this proposed project. Typical Sections and Plan Sheets for the 15% design are provided in Appendices D and E, respectively.

##### **Roadway**

Per the City of Surprise General Plan for 2035, Litchfield Road is classified as a minor arterial with a 55 mph design speed. At the proposed project location, Litchfield Road would be a four-lane roadway with two 12-foot lanes in each direction, a 4-foot raised median, 6-foot outside shoulders, and barrier. Since Litchfield Road would be all-stop controlled at both ramp intersections, the ADOT RDG's indication of 40 mph at crossroads would be used for design purposes within the project limits.

The Litchfield Road alignment is on tangent within the project limits and would be a 2% crowned roadway. The vertical profile consists of a crest curve with maximum 3% grades.

On SR 303L, the exit ramps would be 1-lane parallel type exit ramps with 12-foot lanes, 8-foot outside shoulders, and 2-foot inside shoulders. The ramps would taper out to two lanes in advance of the ramp terminus. Those sections would include two 12-foot lanes, with 2-foot inside and outside shoulders, and curb and gutter. The northbound exit ramp would have barrier on the outside since it is adjacent to new sound wall.

The SR 303L entrance ramps would be 1-lane parallel type entrance ramps. However, per ADOT RDG, two lanes would be carried through the ramp until the back of gore. The entrance ramps would have two 12-foot lanes with 2-foot inside and outside shoulders, and curb and gutter. The northbound entrance ramp would have barrier on the outside since it is adjacent to new sound wall.

The project would also include a 12-foot auxiliary lane between the proposed Litchfield Road TI and El Mirage Road TI per ADOT RDG Section 504.9.

Pedestrian access throughout the TI would not be accommodated and bikes lanes or sidewalks would not be included on Litchfield Road.

End treatments would be included where barrier is introduced in the direction of travel. All new end treatments would comply with AASHTO *Manual for Assessing Safety Hardware* (MASH).

Maintenance roads exist on both the north and south sides of the freeway. The road to the north is paved with asphaltic cement concrete and the road to the south is a dirt path. With this project, the north maintenance road would need to be relocated approximately 215 feet north of its current location and the south approximately 270 feet south of its current location. The interchange would need to be designed to accommodate future maintenance access.

## Traffic

Roadway signing and pavement marking would need to be designed in accordance with the latest ADOT guidelines and standards.

Traffic projections indicate that the proposed interchange would operate acceptably with all-way stop control, so a traffic signal would not need to be designed. However, projected growth and development in the area could change so provisions for a traffic signal to be installed at a later date should be accommodated. Conduit and pull boxes should be installed across the new proposed Litchfield Road TI bridge for a potential future traffic signal. If a future traffic signal is constructed at this TI, it should allow for connection to the City's Traffic Management Center (TMC) via fiber or a wireless connection.

ADOT currently has empty freeway management system (FMS) conduit running on both sides of SR 303L. A project (F0013) will soon be installing fiber in that conduit along with additional FMS infrastructure throughout SR 303L. That project is not proposing to install any FMS devices including cameras, dynamic message signs, count stations, etc. which would be in conflict with the proposed Litchfield Road TI. The existing FMS conduit may need to be relocated to avoid conflicts with the new proposed TI bridge or ramps. A new CCTV camera should be installed at the proposed TI to allow ADOT to monitor freeway and interchange operations. Infrastructure to accommodate future ramp metering should be installed with the new proposed TI such as conduit, pull boxes, loop detectors, and ramp metering/detection cabinets.

Existing roadway lighting on SR 303L is located in the median barrier. The construction of the bridge is not anticipated to impact any existing light poles, but existing lighting conduit in the median would be affected. Underdeck lighting would need to be provided under the new bridge. Ramp lighting would need to be installed and an evaluation should determine if mainline lighting between Litchfield Road and El Mirage Road is adequate after the addition of the auxiliary lane, or if supplemental lighting or new luminaires are needed to meet the necessary light levels. Litchfield Road would also need roadway lighting which should include lighting on the proposed TI bridge.

## Drainage

With the proposed Litchfield Road TI, the existing on-site and off-site drainage facilities would need to be either relocated, extended, or modified. New on-site drainage facilities need to be installed for the proposed ramps and Litchfield Road. These proposed drainage improvements would include the following drainage facilities:

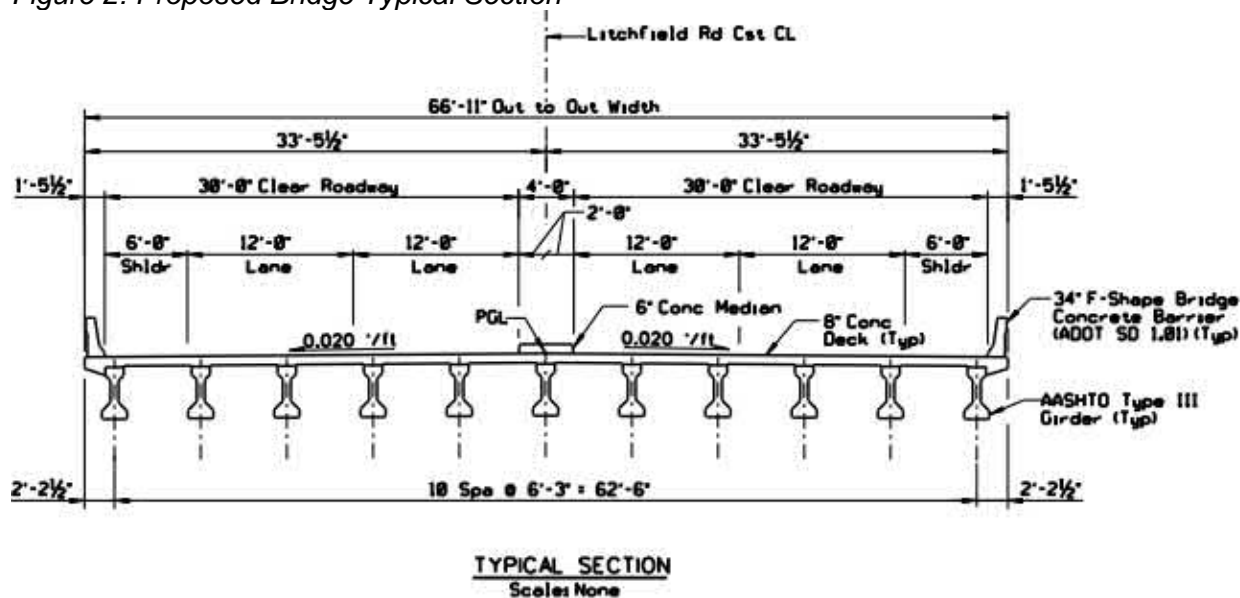
- Culvert #9 would need to be extended to the north underneath Ramp A.
- Culvert #10 would need to be extended to the north and the south underneath Ramp A and Ramp B.
- Culvert #11 would need to be extended to the north and the south underneath Ramp A and Ramp B.
- Culvert #12 would need to be extended to the north underneath Ramp D.
- New 2-8'x5' RCBC would be installed underneath Ramp D aligning with Culvert #12.
- Existing drainage channel or roadside ditches would be either relocated or reconstructed to accommodate the proposed improvements.
- Existing first flush basins would be either modified or relocated.
- New catch basins and storm drains would be installed to intercept and convey runoff from the proposed ramps and Litchfield Road into either RCBCs, drainage channels, roadside ditches, or first flush basins.

## Structures and Walls

Three new structures and walls are proposed for this project including a new bridge to carry Litchfield Road over SR 303L, new sound wall along the south side of the freeway, and a short span of new retaining wall adjacent to the Corte Bella residential community south of SR 303L.

The proposed bridge is a two span AASHTO Type V bridge with a typical section as shown in Figure 2. It would have two 105'-0" long spans and a total length of 215'-0" measured along the profile grade line with zero skew. The abutments have been assumed to be abutment caps supported on drilled shafts. The pier would be a hammerhead type cap with columns supported on drilled shafts.

Figure 2: Proposed Bridge Typical Section



The new proposed bridge at Litchfield Road would be constructed on a horizontal tangent and on a crest vertical curve. The new roadway would be symmetrical in section with a normal crown section and cross slopes of 2.0% through the bridge. The bridge would accommodate four 12'-0" lanes with 6'-0" shoulders separated by a 4'-0" median and have a total out-to-out width of 66'-11". Concrete bridge barriers (34-inch F-Shape) would be installed at the outside edges of the deck.

The proposed bridge superstructure assumes an 8-inch thick deck with 2'-2 1/2" overhangs. Eleven AASHTO Type III Girders would be spaced at 6'-3". There would be a total superstructure depth of 4'-8". The minimum vertical clearance for the bridge at the ultimate configuration would be 16'-5".

Deck drains are not anticipated on this proposed structure. The bridge deck would drain towards each end of the bridge along the outside barriers. Deck runoff would be conveyed into the proposed project on-site storm drain system.

The only known potential substructure conflicts anticipated for this proposed bridge is the existing FMS conduit running along SR 303L outside of the existing pavement and the exiting median-mounted lighting conduit. The FMS conduit could be relocated if needed to accommodate the new proposed bridge and the lighting conduit would need to be modified to accommodate the bridge.

The existing sound wall is in conflict with the proposed Litchfield Road TI and a portion of it would need to be removed. The existing sound wall offset accommodates the SR 303L ultimate 4+1 configuration but it doesn't accommodate for the extra width needed for the auxiliary lane. To accommodate the ultimate configuration, new sound wall would need to be constructed at an offset of an additional 12 feet from its current location. New sound wall on the ramps would be constructed at the back of barrier. See Appendix D for typical sections.

New retaining wall would be needed along the south side of the northbound off ramp to keep slopes within the proposed project R/W and to provide maintenance access.

## **E. PROJECT DEVELOPMENT CONSIDERATIONS**

Design-level mapping and supplemental survey would be required for the proposed project. This PA and the 15% design were developed using survey and design files from Project No. AC-NH-303-A(220)T which was for the construction of SR 303L in 2015.

A bridge selection report was not prepared for the PA. This document may be required by ADOT during final design.

Confirmation of utility locations, horizontally and vertically, by a utility locator would be required during the design phase. No utility conflicts are anticipated with third party utility companies. All identified conflicts are with ADOT-owned infrastructure.

New R/W would need to be acquired from MCDOT for this project. The R/W limits should accommodate a 10-foot maintenance path throughout the project limits. The north R/W limits along the crossroad should extend to ADOT's RDG standard of 660 feet from the ramp radius return and include access control. The south R/W limits should accommodate the relocation of drainage basins.

A temporary construction easement would be needed between the northbound off-ramp and the Corte Bella residential community boundary.

This project does not encroach on the FCDMC property or the utility easements for APS, SRP, and WAPA. Future extension of Litchfield Road would cross these properties and R/W and/or easements would need to be acquired from these stakeholders.

A geotechnical investigation would be required during final design, as well as a Materials Report. The geotechnical recommendations contained herein are preliminary and based on assumptions and geotechnical information available near the site. For estimating purposes, pavement structural sections from Project No. AC-NH-303-A(220)T and Project No. NH-303-A(215)T were assumed as detailed in Section G.

### **Other Projects in the Vicinity**

ADOT programmed construction projects on SR 303L in the vicinity of the future proposed Litchfield Rd TI as listed in the 2019-2023 Five-Year Highway Construction Program are shown in Table 11.

*Table 11: Adjacent ADOT Projects*

<b>Fiscal Year</b>	<b>Item</b>	<b>Project Location</b>	<b>Begin MP</b>	<b>Description</b>
2019	9140	Happy Valley Pkwy to Lake Pleasant Pkwy	25	Construct General Purpose Lane
2019	43219	Northern Ave to US 60 (Grand Ave)	110	Construct FMS
2019	43319	US 60 (Grand Ave) to I-17	119	Construct FMS

The Maricopa County Department of Transportation does not have any projects listed in the 2019-2023 Transportation Improvement Program (TIP) in the vicinity of or adjacent to this project.

The Maricopa Association of Governments has projects listed in the 2018-2022 TIP that are in the vicinity of or adjacent to this project, as listed in ADOT's program shown in Table 11.

The City of Surprise does not show programed construction projects in the vicinity of the future proposed Litchfield Rd TI, but it does list the design of the proposed SR 303L Litchfield Rd TI as a Major Initiative and Policy Issue.

The City of Peoria does not have any projects listed in the 2019-2028 Capital Improvement Program that are in the vicinity of or adjacent to this project.

Within the FCDMC R/W, just north of the project location, is the existing McMicken Levee. The levee is situated approximately 1,300 feet northwest of the SR 303L and proposed interchange. A new McMicken Dam Outlet Channel is currently under design and would be located approximately 450 feet northwest of the existing McMicken Levee. Design of the outlet channel is expected to be complete in the spring of 2019, with construction to begin three to five years after design. Litchfield Road, while outside the limits of this project, would ultimately need to cross both of these outlet channels.

Excess material from the FCDMC project would be available for borrow material on the proposed Litchfield Road TI project. Approximately 320,000 cubic yards of material would be required for this project. Coordination is underway with FCDMC to stockpile the material at the future proposed TI location.

### **Agency and Public Coordination**

The City of Surprise initiated scoping work for this project with MAG to assist in advancing congestion solutions to the surrounding regional roadway network. While the proposed Litchfield Road TI lies within the City of Peoria's planning jurisdiction, both agencies have been involved in the project development and support the additional access location. Continued coordination would be required as the proposed project progresses through design and construction. Updated city boundaries, maintenance limits, and operational responsibilities are among the discussion topics.

No public involvement activities for this project have occurred to date. It is anticipated that a minimum of one public meeting would need to occur during the design phase for this project.

### **Environmental Overview**

If required, the National Environmental Policy Act (NEPA) document prepared for this proposed project is anticipated to be a Categorical Exclusion (CE). A Planning and Environmental Linkages (PEL) Questionnaire and Checklist was completed concurrent with the PA (see Appendix H).

The following major natural resources and environmental regulatory programs would be investigated.

#### **Sensitive Biological Resources**

The proposed project is located within a Fracture Zone on Arizona's Wildlife Linkages map. A review of the Arizona Game and Fish Department (AGFD) On-line Environmental Review Tool shows that no special status species were documented; however, sensitive species occur within two miles of the proposed project vicinity. A Biological Evaluation that assesses resources within the project area would need to be completed to fulfill NEPA requirements. This would include an onsite assessment of the project area to determine whether the project would impact any listed or sensitive species. The results of this effort would be included in the environmental document.

### Wetland and Riparian Areas

There are no wetlands or riparian areas present within the proposed project area.

### Floodplain Encroachment

A review of the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map 04013C1230L shows that the proposed project area south of the McMicken Dam Outlet Channel is not within a 100-year floodplain (Zone X), and north of the channel is in Zone A, Special Flood Hazard Area without Base Flood Elevation.

### Section 401/404 of the Clean Water Act (CWA):

Waters of the United States are present within the proposed project vicinity (McMicken Dam Outlet Channel); impacts to the channel are not likely; therefore, 401/404 permitting is not anticipated. The Arizona Pollutant Discharge Elimination System (AZPDES) permit requires that a project be designed to protect Waters and that erosion control best management practices be implemented. The current scope of this project would likely result in ground disturbance greater than one acre; thus, a Stormwater Pollution Prevention Plan would be required.

### Section 4(f) of the Department of Transportation Act:

No Section 4(f) resources (publicly owned parkland, public recreation facilities, historic properties listed on the National Register of Historic Places, or wildlife refuges) are located within 0.25 mile of the proposed project area that could be impacted by the proposed project. The McMicken Dam outlet channel would need to be further evaluated. Impacts to Section 4(f) resources that cannot be avoided by the project activities would be recommended to FHWA for a determination of *de minimis* impacts or temporary use.

### Cultural Resources

A review of the AZSITE and NRHP databases revealed that 14 cultural resources surveys have been conducted and 10 archaeological sites recorded within a 1-mile radius of the proposed project area. The entire project area was previously surveyed in 1997 by Archaeological Consulting Services. The area was revisited in 2013 by EcoPlan Associates in preparation for widening SR 303L, at which point, portions of the expanded project area were resurveyed. No significant cultural resources were relocated by this effort.

The proposed project area overlaps a previously recorded historic site, AZ T:7:162(ASM). The portion of AZ T:7:162(ASM) within the proposed project area has little or no information potential. This historic-era canal has been previously determined as not eligible for listing in the A/NRHP by the SHPO (2002-2802). As such, it does not warrant additional consideration prior to development.

The McMicken Dam outlet is of undetermined eligibility and would require additional research in order to determine its Arizona/National Register of Historic Places (A/NRHP) eligibility. While the structure would not be impacted by this proposed project, the cumulative impact of the likely extension of Litchfield Road across the spillway by future undertakings resulting from this proposed study warrant future consideration.

Given the complete survey coverage of the area and recent reconnaissance confirming the lack of significant cultural resources, the likelihood that the proposed project area contains additional unidentified cultural resources is low, and new survey is not recommended. Based on the results of the Class I inventory, it is recommended that the proposed project, as currently designed, would not directly impact cultural resources; however, if the McMicken Dam outlet channel were to be evaluated and found to be A/NRHP eligible, that future cumulative impact could adversely affect the structure. The project area investigated for this overview does not indicate that the McMicken Dam outlet channel would be disturbed.

Should the development of the property require federal permits or use federal funds, the federal permitting/funding agency is required to comply with Section 106. Section 106 review requires a historic properties inventory (i.e., archaeological survey and/or historic built environment survey, as appropriate) and consultation with Native American tribes regarding properties of traditional cultural importance. Consultation with Native American tribes is the responsibility of the federal agency.

If archaeological sites are found during the survey, they would be documented, mapped and evaluated for significance using the Secretary of the Interior's criteria. Consultation with the State Historic Preservation Office (SHPO) and other agencies and tribes would need to occur during the NEPA process and project development per Section 106 of the National Historic Preservation Act. The results of this effort would be included in the environmental document.

#### Potential Contaminants

A preliminary review of the Arizona Department of Environmental Quality website shows there are no underground storage tanks (USTs) or leaking underground storage tanks within the proposed project area. It is unknown if possible contaminants are present. Further regulatory database research and field reconnaissance would be conducted to determine the presence of such materials. To address NEPA requirements, a Preliminary Initial Site Assessment (PISA) would need to be completed to document the results. The PISA would be summarized in the environmental document.

#### Air Quality

The proposed project is located in Maricopa County, where the EPA has designated the County as a non-attainment area for particulate matter (PM<sub>10</sub>) and ozone, and a maintenance area for carbon monoxide. The project would not increase traffic capacity, it is therefore exempt from conformity as it would not interfere with the transportation control measure implementation requirements.

#### Noise Impacts

This project would not increase traffic capacity but would introduce roadway segments that could result in sensitive receivers (residences) experiencing increased traffic noise. Following ADOT's Noise Abatement Requirements, a quantitative study of traffic and construction noise impacts would likely be required.

#### Social and Economic Impacts

Some traffic delays may be anticipated during construction but would be minimal. Vehicular access would be maintained throughout construction. Since all work would occur within the R/W, no residential or commercial displacements are anticipated.

### **F. OTHER REQUIREMENTS**

This proposed project is not included in the MAG RTP. The CPS ID and bid advertisement date have not been established. The project is not listed in the ADOT 2019-2023 Five-Year Transportation Facilities Construction Program. If funding becomes available, this proposed project is expected to progress to design and construction. A funding source for the proposed project has not been identified.

Design is anticipated to take approximately 12 months with construction lasting approximately 12 months.

Implementation and construction phasing would be addressed in a later phase of the proposed project. Lane and shoulder closures would be required for paving operations and full closures are

expected during bridge construction. Daytime, nighttime, or weekend work hour restrictions have not yet been identified.

Traffic control requirements would be in accordance with the current edition of the *Manual on Uniform Traffic Control Devices* (MUTCD), the *Arizona Supplement* to the current edition of the *MUTCD*, the *ADOT Traffic Control Design Guidelines*, and/or by special provisions.

The design project manager would develop a customized project schedule that would reflect the full scope of the work. ADOT's Program and Project Management Section, as applicable depending on funding, would provide the necessary technical support to the design team during the schedule development.

## G. ESTIMATED COST

Unit costs were obtained by comparing bid tabulations from the projects listed in Table 12.

*Table 12: Projects Referenced for Unit Costs*

Project No.	Tracs No.	Project Limits	Date of Project Bid
NH 303-A(215)T	303 MA 123 H8576 01C	El Mirage Road TI	October 2014
017-A-(248)T	017 MA 216 H7383 01C	Phoenix-Cordes Jct Hwy, I-17	August 2018
010-B-NFA	010 MA 129 H8587 01C	Ehrenberg-Phoenix Highway, I-10	September 2018

The proposed project estimate is based on the following assumptions:

- Pavement structural sections from Project No. AC-NH-303-A(220)T and Project No. NH-303-A(215)T were used to determine pavement quantities. Concrete pavement costs for mainline travel lanes and shoulders were based on 13" Portland Cement Concrete Pavement (PCCP) over 4" of AB (Class 2). Concrete pavement costs for proposed Litchfield Road and ramps were based on 10" PCCP over 4" AB (Class 2).
- Existing sound wall removal and new sound wall quantities were estimated to accommodate the ultimate 4+1 section.
- Borrow material for roadway embankment would be required. It is likely the borrow material would be provided by the adjacent McMicken Dam Outlet Channel FCD Project No. 204.01.30. However, this has not yet been confirmed and would need to be decided during final design. Therefore, the unit cost included for borrow in this PA does not reflect this potential savings that could be had if the borrow material is provided by Project No. 204.01.30.

The estimated cost for this project are summarized in Table 13. See Appendix F for the complete Estimated Project Cost.

*Table 13: Estimated Project Cost*

Construction Cost	\$ 22,172,199.00
Right-of-Way Cost	\$ 1,699,970.00
Design Cost	\$ 1,773,780.00
Indirect Cost Allocation (FY 2019, 10.02%) <sup>1</sup>	\$ 2,569,724.09
<b>Total Project Cost:</b>	<b>\$ 28,215,673.09</b>

<sup>1</sup> This cost is only applicable if ADOT administers the project.

## H. REQUIRED ACTION BY THE PRIORITY PLANNING ACTION COMMITTEE (PPAC) AND/OR PROJECT REVIEW BOARD (PRB)

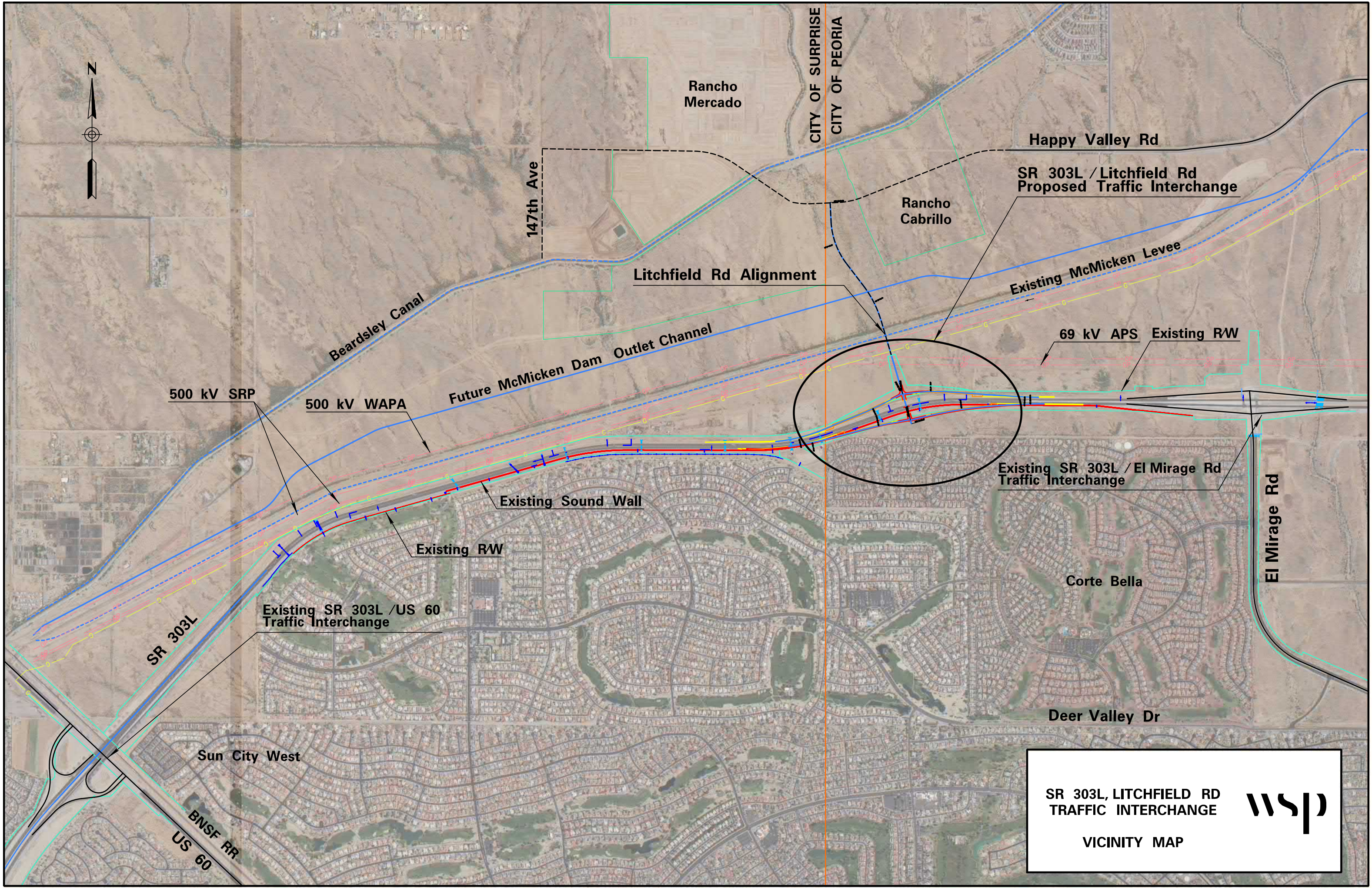
This project would be submitted by the ADOT Central District to the Priority Programming Section of the Multimodal Planning Division for inclusion in the Five-Year Transportation Facilities Construction Program.

## I. INVOLVEMENT SHEET


**Project Name:** SR 303L Litchfield Road Traffic Interchange  
**Location:** Bob Stump Memorial Parkway (SR 303L)  
**Tracs No:** Undetermined

Contacted	Kickoff Meeting	Organization	Involvement				Comments Identifying Issues Which Make Involvement Significant or Minimum
			Significant	Minimum	None	Unknown	
X	X	City of Surprise	X				Coordinate project development and construction
X		City of Peoria	X				Coordinate project development and construction
X	X	MCDOT	X				ROW acquisition
X	X	FCDMC	X				Utility coordination for McMicken Dam Outlet Channel and Levee
		FHWA		X			Potential for Federal Funding requiring ADOT/FHWA Partnership Agreement. If State Funding is used no involvement anticipated.
ADOT Groups/Sections							
		Project Management	X				Manage design
X	X	Central District	X				Construction Engineering & Administration
		Maintenance		X			Review plans
		Roadway Design		X			Review roadway plans
		Pavement Design		X			Prepare materials design report and pavement design summary
		Bridge Design		X			Review bridge report and plans
		Drainage Design		X			Review drainage report and plans
		Traffic Design		X			Review traffic documents and plans
		Photogrammetry & Mapping		X			Consultant to provide new mapping
		Geotechnical Section		X			Review geotechnical reports
		Environmental Planning	X				Review existing environmental documentation and clearance letter, hazardous materials testing, etc.
		Roadside Development		X			Review seeding specification and SWPP
		Right-of-Way	X				New ROW and ROW clearance letter
		Utilities & Railroad		X			Utility clearance letter
		Contracts & Specifications	X				Review PS&E package and prepare bid package
		Communications		X			Coordinate with property owners and public

**APPENDIX A:**  
**Vicinity Map**


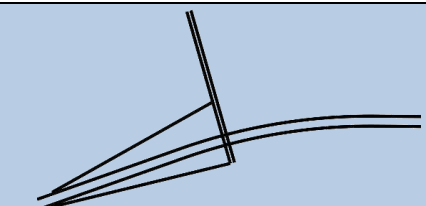
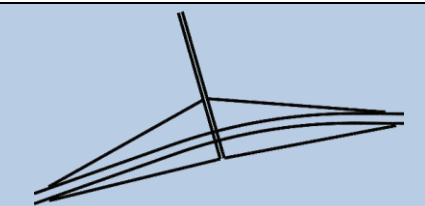
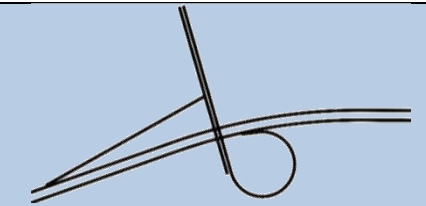
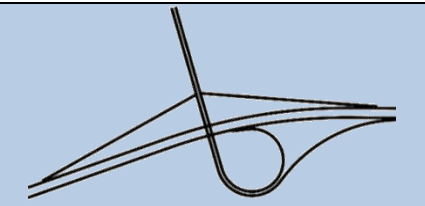


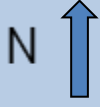
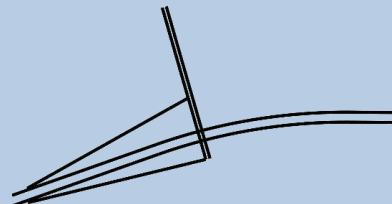
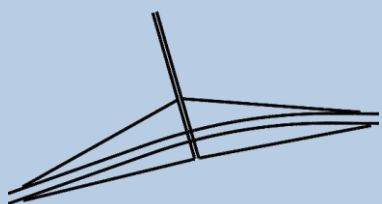
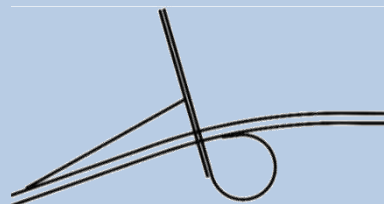
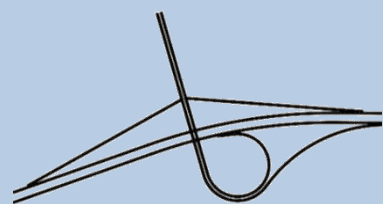
SR 303L, LITCHFIELD RD  
TRAFFIC INTERCHANGE



VICINITY MAP

**APPENDIX B:**  
**Alternative Evaluation Matrix**

					
Evaluation Criteria		OPTION 1 Half Diamond	OPTION 2 Full Diamond	OPTION 3 Half Trumpet	OPTION 4 Full Trumpet
Operation/Access	Operational Safety	(+) Minimal potential for conflicts	(0) Potential for angular crashes	(-) High speed differential between mainline and loop ramp. Potential for crashes on loop ramp due to vehicles going too fast.	(-) High speed differential between mainline and loop ramp. Potential for crashes on loop ramp due to vehicles going too fast.
	Mainline Operation <i>2035 MAG Model Projections</i>	(+) Ramp merge: LOS B/B. Ramp diverge: LOS B/B.	(+) Ramp merge: LOS B/B. Ramp diverge: LOS B/B. Weave (between Litchfield and El Mirage): LOS B/B or better.	(+) Ramp merge: LOS B/B. Ramp diverge: LOS B/B or better.	(+) Ramp merge: LOS B/B. Ramp diverge: LOS B/B or better. Weave (between Litchfield and El Mirage): LOS B/B or better.
	Crossroad Intersection Operation <i>Intersection LOS D for 2035 volumes</i>	(+) Free-flow movements operate at LOS A/A with minimal queuing.	(+) Stop-controlled intersections both operate at LOS B/B. Up to 113' of queuing in the WB direction.	(+) Free-flow movements eliminate delay and queuing.	(+) Free-flow movements eliminate delay and queuing.
	FHWA Change of Access Report (COAR)	(0) Not required	(0) Not required	(0) Not required	(0) Not required
	Auxiliary Lane	(0) Not required	(0) Required per ADOT RDG (Section 504.9) between Litchfield and El Mirage TIs	(0) Not required	(0) Required per ADOT RDG (Section 504.9) between Litchfield and El Mirage TIs
	Accommodate Ultimate SR 303L Facility (Interim is inside)	(0) Accomodates ultimate 303 configuration (1 HOV + 4 General Purpose)	(0) Accomodates ultimate 303 configuration (1 HOV + 4 General Purpose)	(0) Accomodates ultimate 303 configuration (1 HOV + 4 General Purpose)	(0) Accomodates ultimate 303 configuration (1 HOV + 4 General Purpose)
	Access to Adjacent Properties	(0) No public access is desired south of SR 303L. (+) Maintenance access can be easily accommodated	(0) No public access is desired south of SR 303L. (+) Maintenance access can be easily accommodated	(0) No public access is desired south of SR 303L. (-) Maintenance access may prove difficult	(0) No public access is desired south of SR 303L. (-) Maintenance access may prove difficult
Technical Elements	Earthwork	(0) Borrow material to be provided by FCDMC (+) Moderate borrow for ramps and crossroad	(0) Borrow material to be provided by FCDMC (-) Substantial borrow for ramps and crossroad	(0) Borrow material to be provided by FCDMC (+) Moderate borrow for loop ramp and crossroad	(0) Borrow material to be provided by FCDMC (-) Substantial borrow for loop ramp and crossroad
	Drainage	(0) Extend 1 culvert (both ends), 1 new culverts required, reconfigure 2 first flush basins, and impact to south channel	(0) Extend 1 culvert (both ends), 2 new culverts required, reconfigure 5 first flush basins, and impact to north and south channels	(0) Extend 2 culverts (one end), 2 new culverts required, reconfigure 1 first flush basin, and impact to south channel (-) Infield area of loop will need to be drained	(0) Extend 2 culverts (one end), 2 new culverts required, reconfigure 3 first flush basins, and impact to north and south channels (-) Infield area of loop will need to be drained
	Bridge Length <i>Accommodates Future SR 303L Widening</i>	(0) 2 Span AASHTO Girder (266')	(0) 2 Span AASHTO Girder (266')	(0) 2 Span AASHTO Girder (266') (-) Full height abutment required on south side to accommodate extra width for the loop ramp	(0) 2 Span AASHTO Girder (266') (-) Full height abutment required on south side to accommodate extra width for the loop ramp
	Bridge Clear Distance (Width)	(-) 2-thru lanes, provide extra width for ultimate configuration 4 - 12' Lanes = 48' 4' Median 2 - 4' Shoulders= 8' Total= 60'	(-) 4-thru lanes 4 - 12' Lanes = 48' 4' Median 2 - 4' Shoulders= 8' Total= 60'	(+) 1-thru lane, provide extra width for ultimate configuration 2-12' Lanes = 24' 2' Wide Median Barrier 2-4' Inside Shoulders = 8' 2-10' Outside Shoulders = 20' Total= 54'	(+) 2-thru lanes 2-12' Lanes = 24' 2' Wide Median Barrier 2-4' Inside Shoulders = 8' 2-10' Outside Shoulders = 20' Total= 54'
	Retaining Walls	(+) Short retaining wall needed on outside of north bound off ramp for portion that hugs adjacent Corte Bella community	(+) Short retaining wall needed on outside of north bound off ramp for portion that hugs adjacent Corte Bella community	(-) Retaining wall needed on outside of loop ramp for portion adjacent to Corte Bella community (-) Retaining walls needed on both sides of full height bridge abutment.	(-) Retaining wall needed on outside of loop ramp for portion adjacent to Corte Bella community (-) Retaining walls needed on both sides of full height bridge abutment.
	Sound Walls	(0) Moderate reconstruction of existing sound wall (approx. 2,588 LF)	(-) Substantial reconstruction of existing sound wall at TI location (approx. 4,456 LF) (-) Barrier or guardrail required on outside of auxillary lane to protect soundwall hazard within clear zone	(+) Minimal reconstruction of existing sound wall (approx. 1,678 LF)	(0) Moderate reconstruction of existing sound wall at TI location (approx. 2,660 LF) (-) Barrier or guardrail required on outside of auxillary lane to protect soundwall hazard within clear zone
<b>LEGEND:</b> (+) Advantage    (0) Neutral    (-) Disadvantage <b>LOS X/X</b> AM Peak / PM Peak					

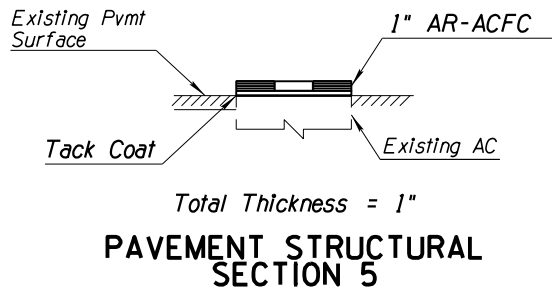
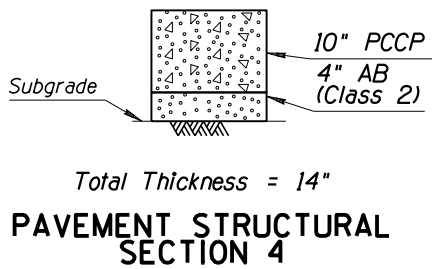
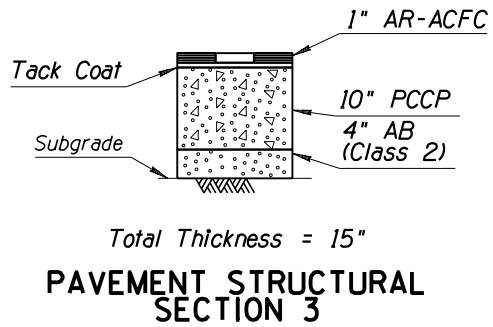
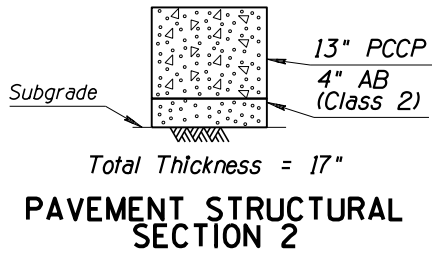
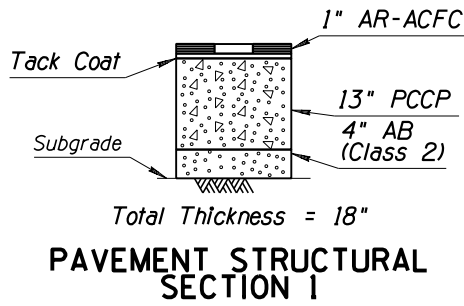
					
Evaluation Criteria		OPTION 1 Half Diamond	OPTION 2 Full Diamond	OPTION 3 Half Trumpet	OPTION 4 Full Trumpet
Technical Elements	Traffic/Lighting/ITS	(+) U-turn movements allowed (0) Lighting expected to be typical (0) Minimal adjustments to existing FMS conduit	(+) U-turn movements allowed (0) Lighting expected to be typical (0) Minimal adjustments to existing FMS conduit	(-) U-turn movements not allowed (-) May be difficult to avoid light spill into homes. (0) Minimal adjustments to existing FMS conduit	(-) U-turn movements not allowed. (-) May be difficult to avoid light spill into homes (0) Minimal adjustments to existing FMS conduit
	Environmental Considerations	(0) Sound wall will mitigate noise concerns	(0) Sound wall will mitigate noise concerns	(0) Sound wall will mitigate noise concerns (-) More ground disturbance required (-) Visual change for adjacent Corte Bella residential community	(0) Sound wall will mitigate noise concerns (-) More ground disturbance required (-) Visual change for adjacent Corte Bella residential community
	Utilities ( <i>Overhead Power, FMS, Gas</i> )	Bridge pier will impact existing median lighting	(0) Bridge pier will impact existing median lighting	(0) Bridge pier will impact existing median lighting	(0) Bridge pier will impact existing median lighting
	Design Variances / Exceptions	None required	(0) None required	(-) RDG horizontal sight distance requirement not met for loop ramp	(-) RDG horizontal sight distance requirement not met for loop ramp
	Constructability	(0) Typical construction applications	(0) Typical construction applications (+) Facilitates MOT during bridge construction	(0) Typical construction applications	(0) Typical construction applications
Agency/Public/Policy	Environmental Document	(0) Categorical Exclusion (CE)	(0) Categorical Exclusion (CE)	(0) Categorical Exclusion (CE)	(0) Categorical Exclusion (CE)
	SR 303L Interchange Type ( <i>Driver Familiarity / Expectancy</i> )	(0) Diamond TI Configuration within the 303 corridor	(0) Diamond TI Configuration within the 303 corridor	(0) Loop off ramps within the 303 corridor	(0) Loop off ramps within the 303 corridor
	Impact to Adjacent Developments	(0) Same area of adjacent Corte Bella residential community will remain within close proximity to freeway (approx. 50’ from ramp to property wall)	(0) Same area of adjacent Corte Bella residential community will remain within close proximity to freeway (approx. 50’ from ramp to property wall)	(-) New area of adjacent Corte Bella residential community will be within close proximity to the loop ramp and introduced to ramp traffic noise and vertical visuals. (approx. 45’ from ramp to property wall)	(-) New area of adjacent Corte Bella residential community will be within close proximity to the loop ramp and introduced to ramp traffic noise and vertical visuals. (approx. 45’ from ramp to property wall)
	Agency Acceptability				
	Pedestrian / Bike Compatibility	(0) Access will not be provided for pedestrians and bikes to travel through the interchange.	(0) Access will not be provided for pedestrians and bikes to travel through the interchange.	(0) Access will not be provided for pedestrians and bikes to travel through the interchange.	(0) Access will not be provided for pedestrians and bikes to travel through the interchange.
	Public Feedback				
R/W	Right-of-Way	(0) Moderate R/W acquisition (approx. 24 Acres)	(0) Moderate R/W acquisition (approx. 24 Acres)	(-) More R/W required to accommodate the loop ramp (approx. 30 Acres)	(-) More R/W required to accommodate the loop ramp (approx. 30 Acres)
Cost	Total Project Cost ( <i>Compared 303 &amp; El Mirage TI, and I-17 &amp; Happy Valley/Pinnacle Peak Bid Tabs to obtain unit costs</i> )	(+) \$19 M	(-) \$28.5 M	(+) \$20.9 M	(-) \$28.8 M
LEGEND:    (+) Advantage    (0) Neutral    (-) Disadvantage    LOS X/X    AM Peak / PM Peak					


**APPENDIX C:**  
**Project Photos**



**APPENDIX D:**  
**Typical Sections**

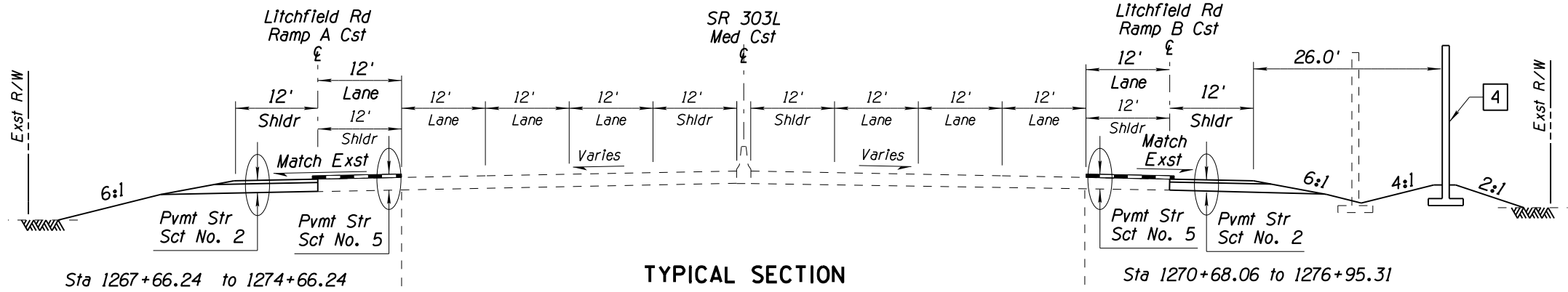
F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	RECORD DRAWING
9	ARIZ.	0600-0110-17-E003- 0780-0K.000008			



		NAME		DATE		MARICOPA ASSOCIATION OF GOVERNMENTS TRANSPORTATION DIVISION	PRELIMINARY <b>STAGE I</b> Review NOT FOR CONSTRUCTION OR RECORDING		
DESIGN		MEM		01/19					
DRAWN		CPG		01/19					
CHECKED		JHM		01/19					
				WSP USA Inc. 1230 W. Washington St. Suite 400 Tempe, AZ 85281				PAVEMENT STRUCTURAL SECTIONS	DWG NO.
ROUTE		LOCATION							
SR303L		SR 303 - LITCHFIELD RD							
TRACS NO.								___ OF ___	

DATE: LOCATION: REVISIONS: FINISHED PLANS: SURVEY NO.

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	RECORD DRAWING
9	ARIZ.	0600-0110-17-E003-0780-0K.000008			

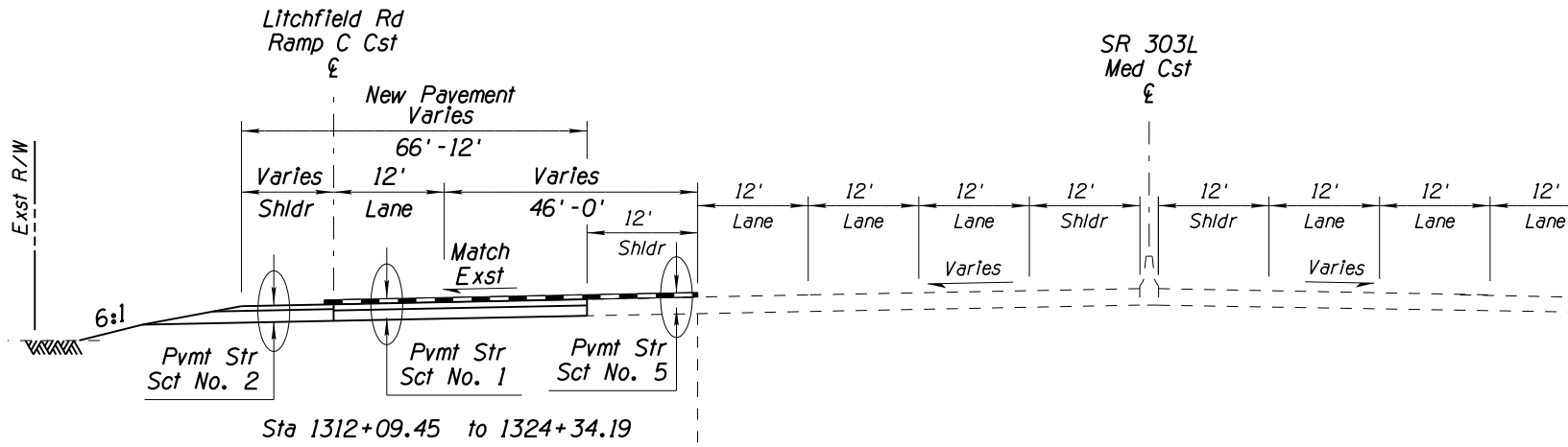
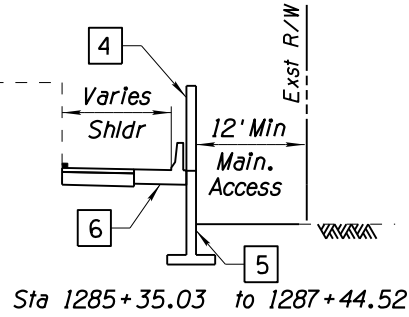
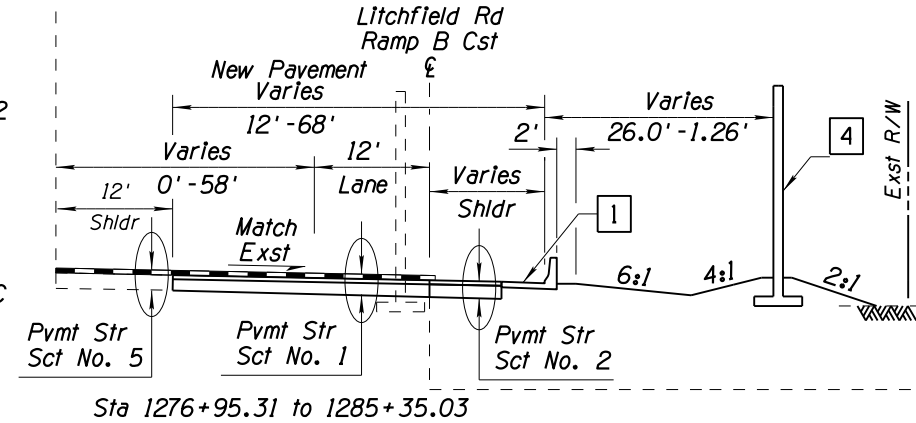
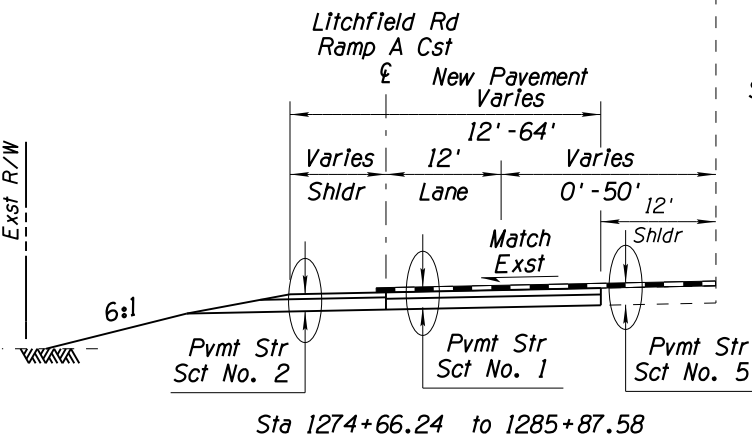


TYPICAL SECTION

SR 303L  
At Litchfield Rd A & B Gores

SR 303L SB Sta 1267+66.24 to 1285+87.58  
SR 303L NB Sta 1270+68.06 to 1287+44.52

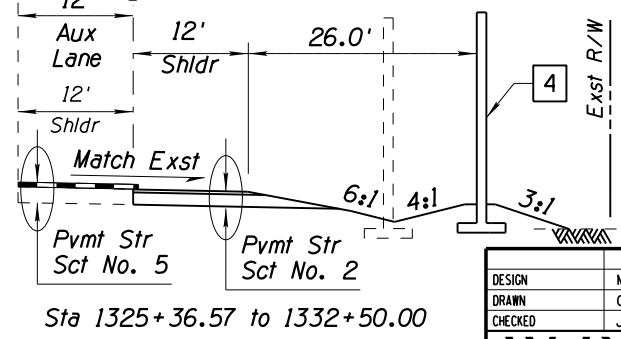
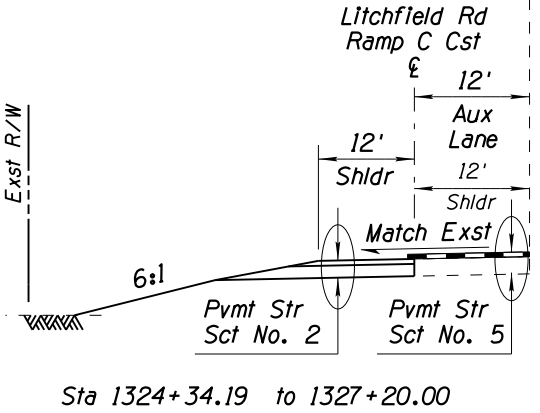
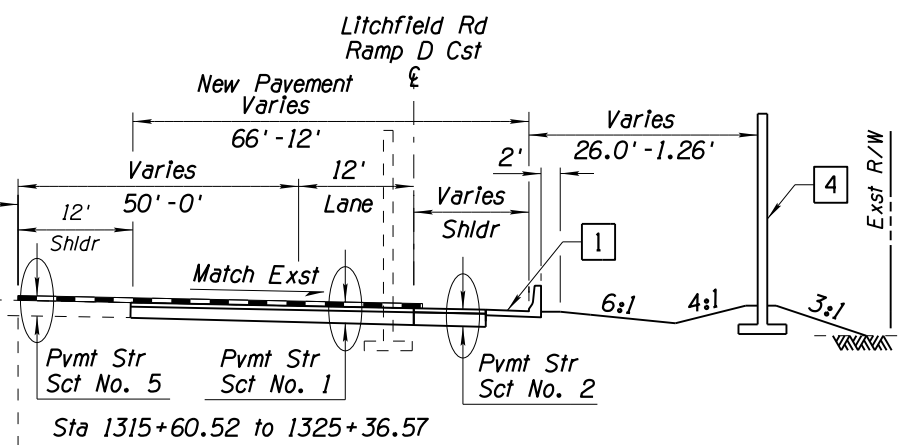
- 1 Concrete Barrier, ADOT Std C-10.50
- 2 Concrete Single Curb & Gutter, ADOT Std C-05.10, Type C
- 3 Concrete Single Curb, ADOT Std C-05.10, Type A
- 4 New Soundwall
- 5 New Retaining Wall
- 6 34" F-Shape Concrete Barrier, SD 1.01



TYPICAL SECTION

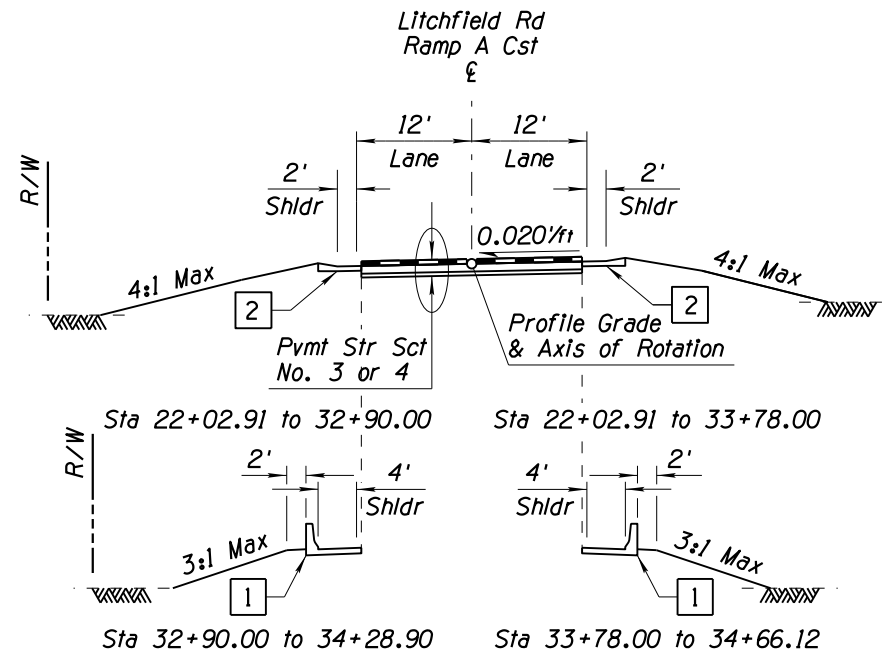
SR 303L  
At Litchfield Rd C & D Gores

SR 303L SB Sta 1312+09.45 to 1327+20.00  
SR 303L NB Sta 1315+60.52 to 1332+50.00



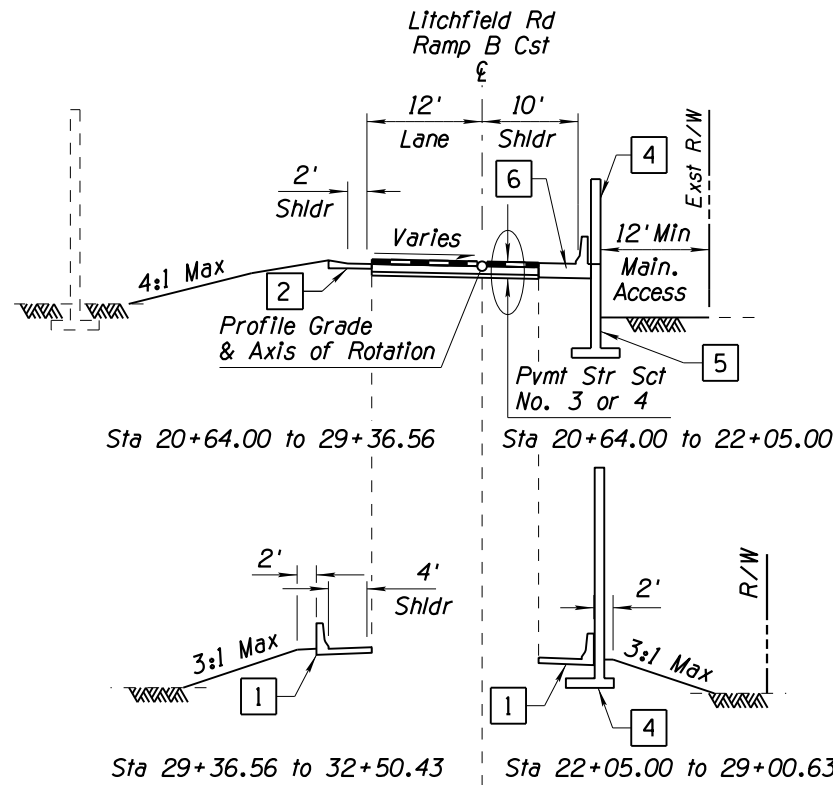
DESIGN	MEM	DATE	01/19	MARICOPA ASSOCIATION OF GOVERNMENTS TRANSPORTATION DIVISION	PRELIMINARY <b>STAGE I</b> Review NOT FOR CONSTRUCTION OR RECORDING
DRAWN	CPG	DATE	01/19		
CHECKED	JHM	DATE	01/19		
ROUTE		LOCATION	SR 303 - LITCHFIELD RD		
SR303L		TRACS NO.			DWG NO.
					OF

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	RECORD DRAWING
9	ARIZ.	0600-0110-17-E003-0780-OK.000008			



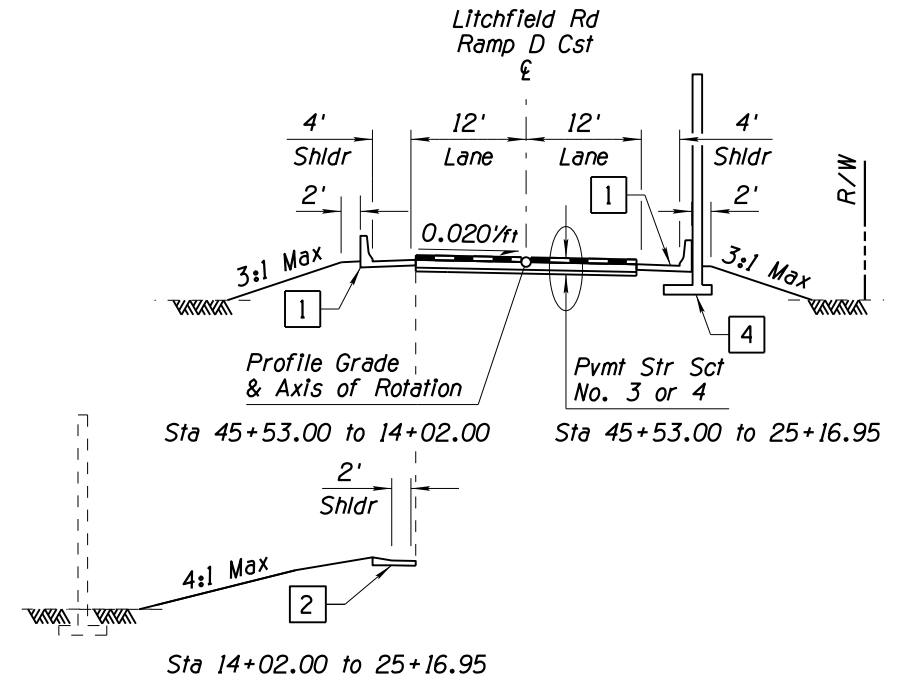
### TYPICAL SECTION

Litchfield Rd Ramp A  
Entrance Ramp  
Sta 22+02.91 to 34+66.12



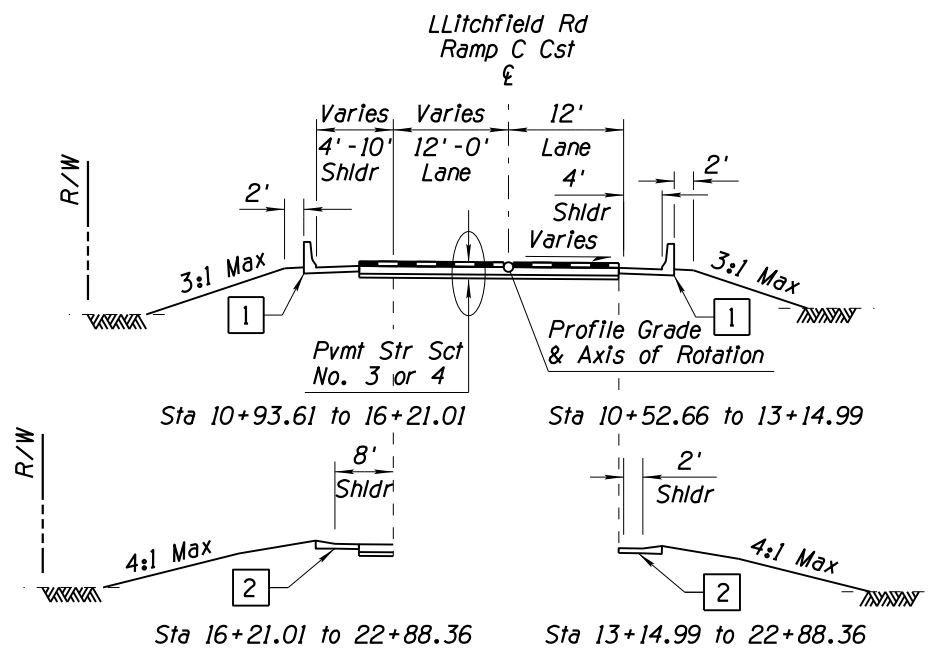
### TYPICAL SECTION

Litchfield Rd Ramp B  
Exit Ramp  
Sta 20+64.00 to 32+50.63



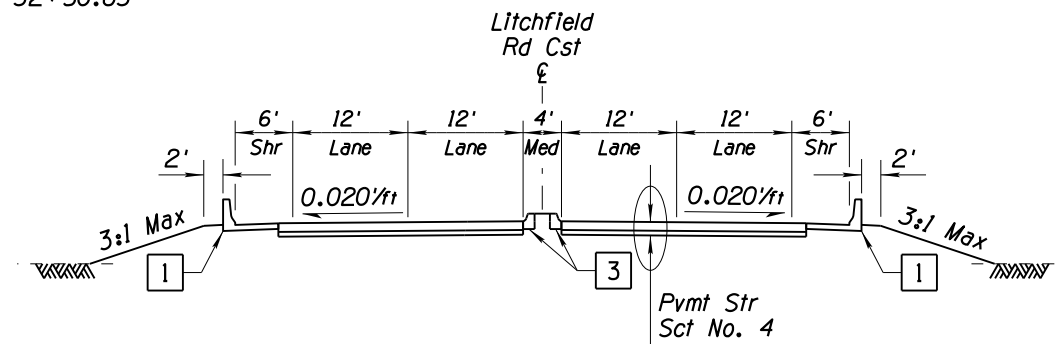
### TYPICAL SECTION

Litchfield Rd Ramp D  
Entrance Ramp  
Sta 45+53.00 to 25+16.95



### TYPICAL SECTION


Litchfield Rd Ramp C  
Exit Ramp  
Sta 10+52.66 to 22+88.36



### TYPICAL SECTION

Litchfield Rd  
Sta 46+80.00 to 49+66.76  
Sta 52+09.89 to 53+62.20

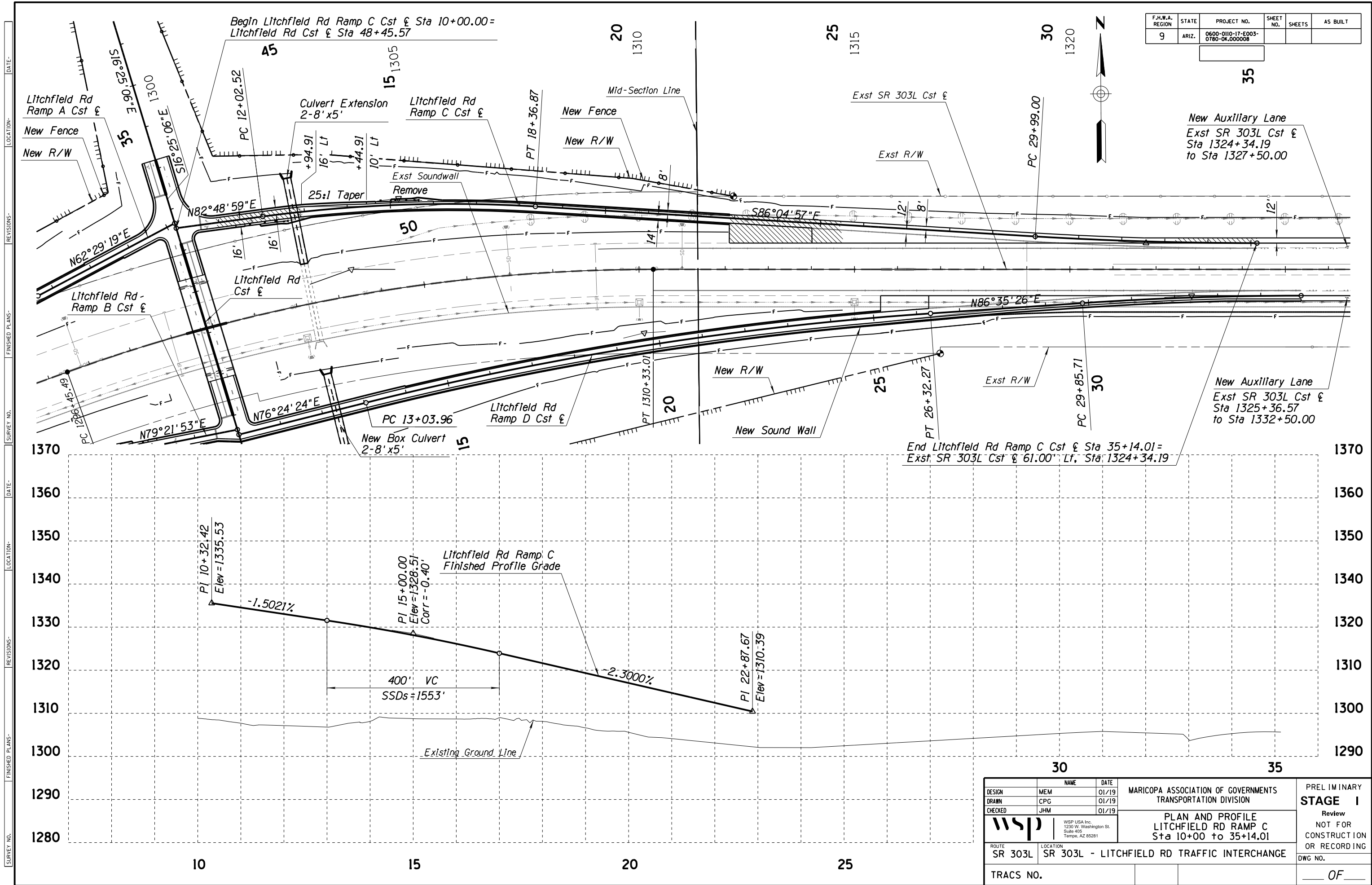
- 1 Concrete Barrier, ADOT Std C-10.50
- 2 Concrete Curb & Gutter, ADOT Std C-05.10 Type C
- 3 Concrete Single Curb, ADOT Std C-05.10 Type A
- 4 New Soundwall
- 5 New Retaining Wall
- 6 34" F-Shape Concrete Barrier, SD 1.01

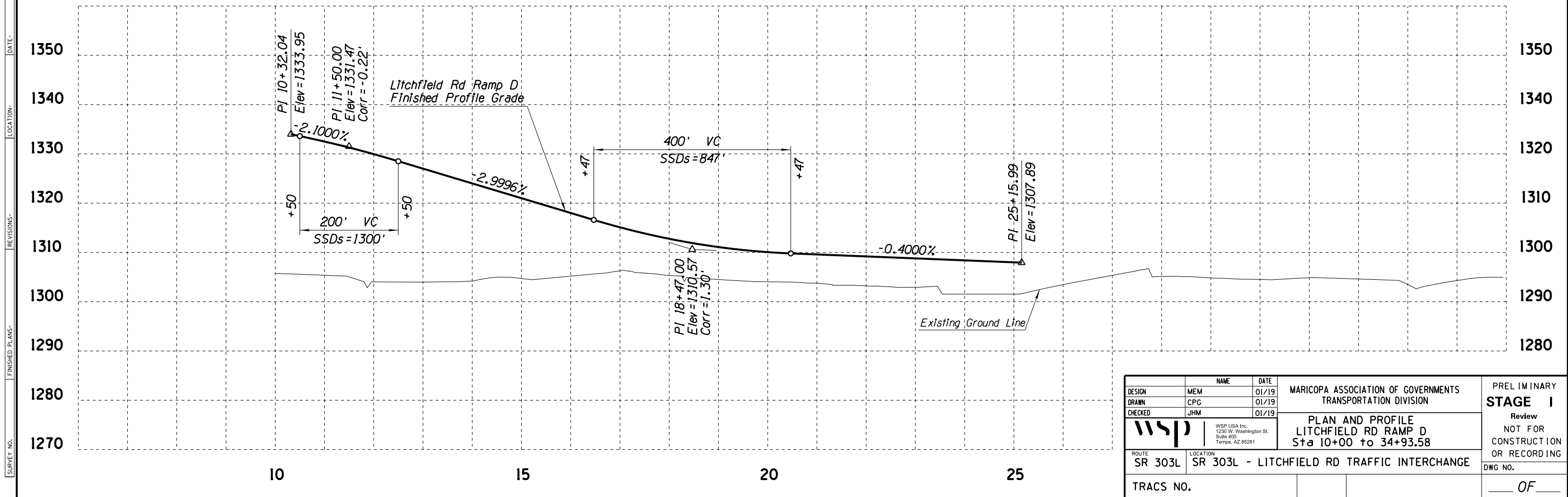
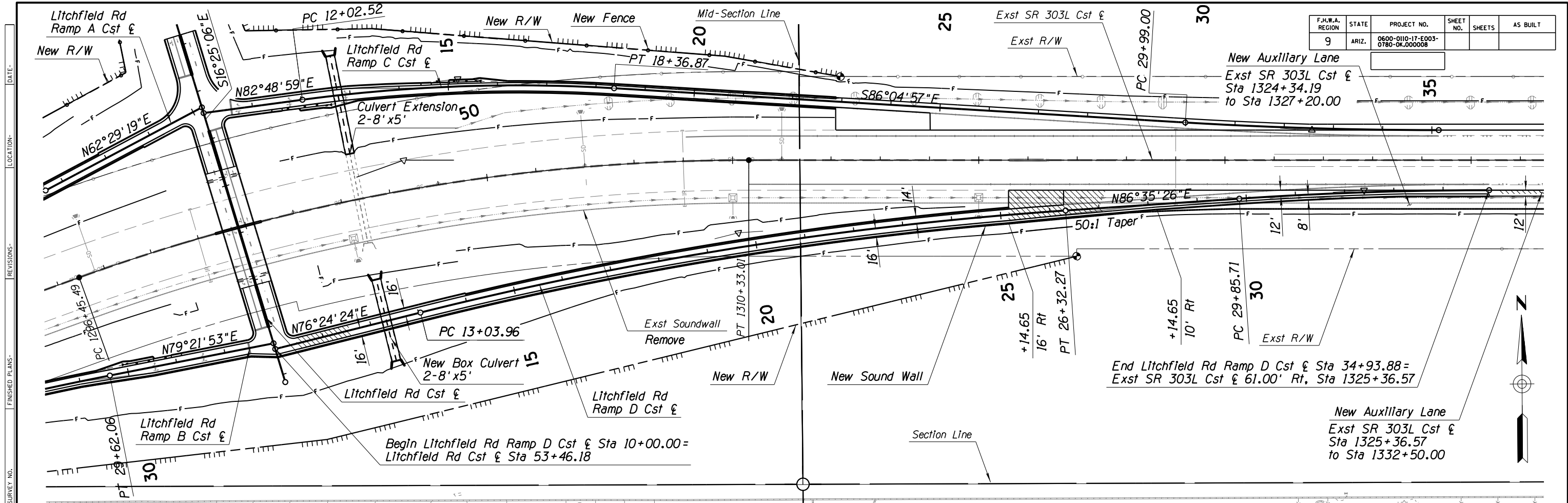
		NAME	DATE	MARICOPA ASSOCIATION OF GOVERNMENTS TRANSPORTATION DIVISION	PRELIMINARY <b>STAGE I</b> Review NOT FOR CONSTRUCTION OR RECORDING
DESIGN		MEM	01/19		
DRAWN		CPG	01/19		
CHECKED		JHM	01/19		
		WSP USA Inc. 1230 W. Washington St. Suite 400 Tempe, AZ 85281		TYPICAL SECTIONS SR 303L	DWG NO.
ROUTE SR303L		LOCATION SR 303 - LITCHFIELD RD			
TRACS NO.					
				___ OF ___	

**APPENDIX E:**  
**Stage I (15%) Plans**

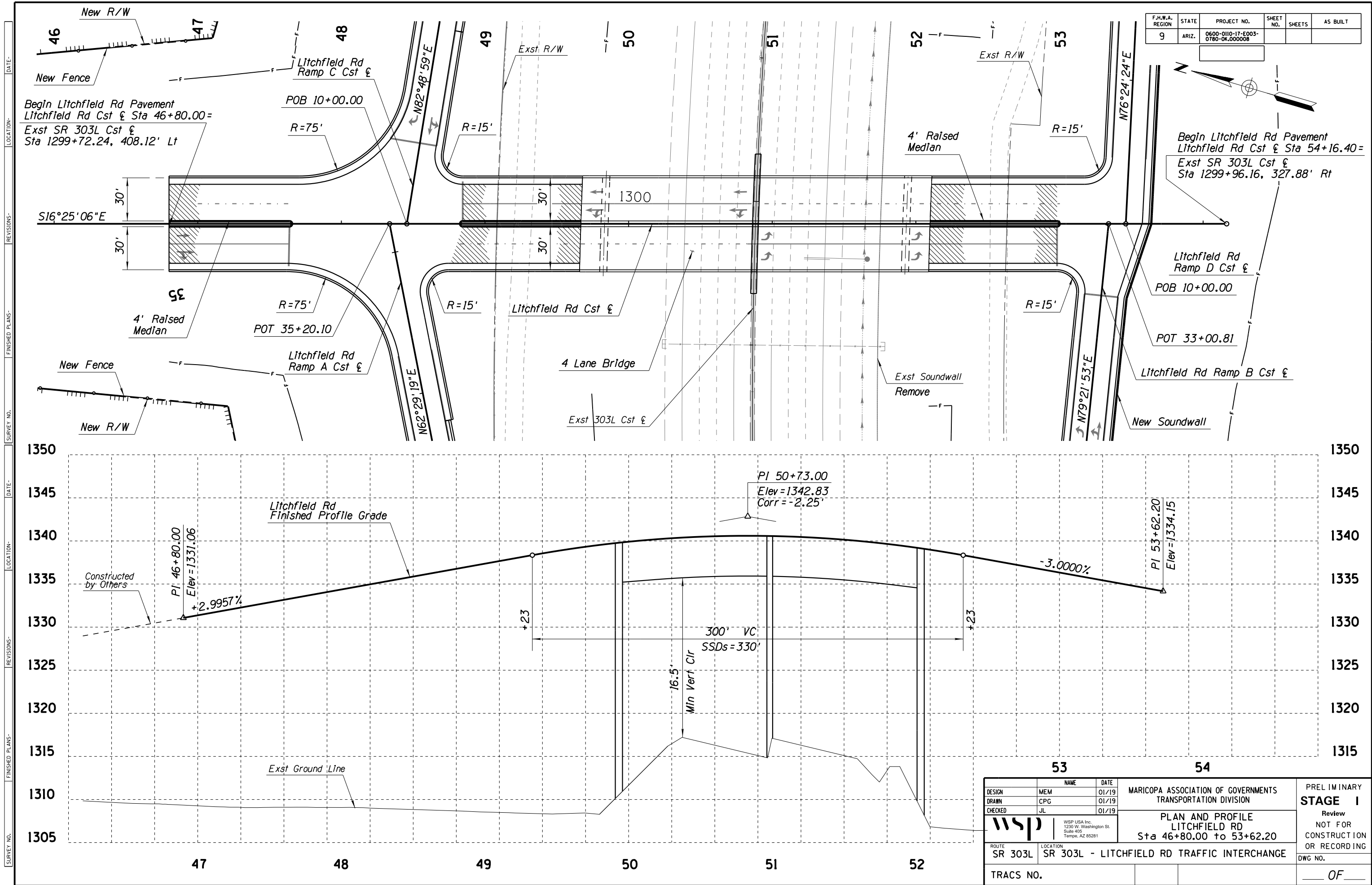








DESIGN	MEM	DATE	01/19
DRAWN	CPG	DATE	01/19
CHECKED	JHM	DATE	01/19
<b>WSP</b> WSP USA Inc. 1230 W. Washington St. Suite 405 Tempe, AZ 85281			
ROUTE	SR 303L - LITCHFIELD RD TRAFFIC INTERCHANGE		
LOCATION	SR 303L - LITCHFIELD RD TRAFFIC INTERCHANGE		
TRACS NO.			
MARICOPA ASSOCIATION OF GOVERNMENTS TRANSPORTATION DIVISION			PRELIMINARY <b>STAGE I</b> Review NOT FOR CONSTRUCTION OR RECORDING
PLAN AND PROFILE LITCHFIELD RD RAMP D Sta 10+00 to 34+93.88			DWG NO. OF



**APPENDIX F:**  
**Estimated Project Cost**

ITEM NO	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT
<b>DETAILED ESTIMATE</b>					
2020023	REMOVE EXISTING CONCRETE MEDIAN BARRIER	L.FT.	98	\$60.00	\$5,880.00
2020101	REMOVE FENCE	L.FT.	2,770	\$2.25	\$6,232.50
2020052	REMOVE (NOISE WALL)	L.FT.	6,645	\$15.00	\$99,675.00
2020029	REMOVAL OF ASPHALTIC CONCRETE PAVEMENT	SQ.YD.	2,660	\$25.00	\$66,500.00
2030301	ROADWAY EXCAVATION	CU.YD.	5,070	\$10.00	\$50,700.00
2030401	DRAINAGE EXCAVATION (Ditches)	CU.YD.	13,300	\$5.00	\$66,500.00
2030401	DRAINAGE EXCAVATION (First Flush)	CU.YD.	1,500	\$10.00	\$15,000.00
2030901	BORROW	CU.YD.	319,112	\$10.00	\$3,191,120.00
3030022	AGGREGATE BASE, CLASS 2	CU.YD.	4,559	\$30.00	\$136,770.00
4010010	PORTLAND CEMENT CONCRETE PAVEMENT (10")	SQ.YD.	11,623	\$40.00	\$464,920.00
4010013	PORTLAND CEMENT CONCRETE PAVEMENT (13")	SQ.YD.	16,857	\$55.00	\$927,135.00
4040111	BITUMINOUS TACK COAT	TON	10	\$425.00	\$4,250.00
4040116	APPLY BITUMINOUS TACK COAT	hour	20	\$155.00	\$3,100.00
4140040	ASPHALTIC CONCRETE FRICTION COURSE (ASPHALT-RUBBER)	TON	1,703	\$42.00	\$71,526.00
4140042	ASPHALT RUBBER MATERIAL (FOR AR-ACFC)	TON	154	\$500.00	\$77,000.00
4140044	MINERAL ADMIXTURE (FOR AR-ACFC)	TON	16	\$90.00	\$1,440.00
5012524	STORM DRAIN PIPE (24")	L.FT.	1,900	\$90.00	\$171,000.00
5010107	PIPE, CORRUGATED METAL, SLOTTED, 18"	L.FT.	760	\$140.00	\$106,400.00
5014524	FLARED END SECTION, 24" (C-13.20 OR C-13.25)	EACH	38	\$800.00	\$30,400.00
5030413	CONCRETE CATCH BASIN	EACH	33	\$5,000.00	\$165,000.00
6011110	F-SHAPED BRIDGE CONCRETE BARRIER (34", SD 1.01)	L.FT.	248	\$85.00	\$21,080.00
9999903A	EXTEND REINFORCED CONCRETE BOX CULVERT (SD 6.01, 2-8'x5')	L.SUM	1	\$273,539.00	\$273,539.00
9999903B	EXTEND REINFORCED CONCRETE BOX CULVERT (SD 6.01, 2-10'5')	L.SUM	1	\$472,910.00	\$472,910.00
9999903C	NEW REINFORCED CONCRETE BOX CULVERT (SD 6.01, 2-8'x5')	L.SUM	1	\$175,929.00	\$175,929.00
7041501	PAVEMENT MARKING (SIGNING AND PAVEMENT MARKING)	L.SUM	1	\$755,000.00	\$755,000.00
7330001	TRAFFIC SIGNAL	L.SUM	1	\$41,000.00	\$41,000.00
7360300	ROADWAY LIGHTING / FMS	L.SUM	1	\$463,000.00	\$463,000.00
8070001	LANDSCAPE ESTABLISHMENT	L.SUM	1	\$300,000.00	\$300,000.00
9020004	CHAIN LINK FENCE, TYPE 1 (72")	L.FT.	3,913	\$15.00	\$58,695.00
9050025	GUARD RAIL TERMINAL (	EACH	4	\$4,000.00	\$16,000.00
9050405	GUARD RAIL TRANSITION, W-BEAM TO CONCRETE HALF BARRIER (C-	EACH	4	\$4,000.00	\$16,000.00
9080051	CONCRETE CURB AND GUTTER (C-05.10) (TYPE A)	L.FT.	354	\$12.00	\$4,248.00
9080084	CONCRETE CURB AND GUTTER (C-05.10) (TYPE C, C-1)	L.FT.	6,559	\$15.00	\$98,385.00
9100008	CONCRETE BARRIER (C-10.52, 4.5' Gutter)	L.FT.	6,613	\$60.00	\$396,780.00
9100201	CONCRETE MEDIAN BARRIER	L.FT.	98	\$100.00	\$9,800.00
9130001	RIPRAP (DUMPED)	CU.YD.	125	\$100.00	\$12,500.00
9140118	RETAINING WALL (MSE)	SQ.FT.	2,674	\$65.00	\$173,810.00
9140133	NOISE BARRIER WALL (	SQ.FT.	104,490	\$40.00	\$4,179,600.00
999XX01	BRIDGE (LITCHFIELD RD)	SQ.FT.	16,230	\$150.00	\$2,434,500.00

Project No.  
0600-0110-17-E003-0780-0K.000008  
SR 303L, Litchfield Road Traffic Interchange

MARICOPA ASSOCIATION OF GOVERNMENTS  
Estimated Engineering Construction Cost

ITEM NO	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT
	<b>SUBTOTAL 1</b>				<b>\$13,128,824.50</b>
9340087	MISCELLANEOUS WORK			20.00%	\$2,625,800.00
	<b>SUBTOTAL 2</b>				<b>\$15,754,624.50</b>
2090005	FURNISH WATER			1.00%	\$157,500.00
7010001	MAINTENANCE AND PROTECTION OF TRAFFIC			7.00%	\$1,102,800.00
8101013	EROSION CONTROL AND POLLUTION PREVENTION			1.00%	\$157,500.00
9240170	CONTRACTOR QUALITY CONTROL			1.00%	\$157,500.00
9250001	CONSTRUCTION SURVEY AND LAYOUT			2.00%	\$315,100.00
	<b>SUBTOTAL 3</b>				<b>\$17,645,024.50</b>
9010001	MOBILIZATION			10.00%	\$1,764,500.00
	<b>SUBTOTAL 4</b>				<b>\$19,409,524.50</b>
	CONTINGENCY			5.00%	\$970,500.00
	CONSTRUCTION ENGINEERING			9.00%	\$1,746,900.00
	UTILITY RELOCATION WORK	L.SUM		\$0.00	\$0.00
	PCCP MATERIALS QUALITY	SQ. YD.		\$1.50	\$42,720.00
	ASPHALT MATERIALS QUALITY	TON		\$1.50	\$2,554.50
	<b>CONSTRUCTION COST TOTAL</b>				<b>\$22,172,199.00</b>
<b>RIGHT-OF-WAY &amp; DESIGN ENGINEERING COST</b>					
	RIGHT-OF-WAY REQUIREMENTS	L. SUM		\$1,699,970.00	\$1,699,970.00
	DESIGN ENGINEERING			8.00%	\$1,773,780.00
	<b>RIGHT-OF-WAY AND DESIGN COST TOTAL</b>				<b>\$3,473,750.00</b>
<b>PROJECT COST</b>					
	INDIRECT COST ALLOCATION (FY 2019)			10.02%	<b>\$2,569,724.09</b>
	<b>TOTAL PROJECT COST</b>				<b>\$28,215,673.09</b>
<b>SUMMARY</b>					
CONSTRUCTION COST TOTAL					\$22,172,199.00
RIGHT-OF-WAY AND DESIGN COST TOTAL					\$3,473,750.00
ICAP					\$2,569,724.09
<b>TOTAL PROJECT CONSTRUCTION COST</b>					<b>\$28,215,673.09</b>

**APPENDIX G:**  
**Limited Geotechnical Evaluation Report**

# **LIMITED GEOTECHNICAL EVALUATION**

**SR 303L Litchfield Road Traffic Interchange**

**MAG Project No. 0600-0110-17-E003-0780-0K.000008**

**Submitted to:**

**Maricopa Association of Governments  
Phoenix, Arizona**

**Submitted by:**



**April 30, 2019**

April 30, 2019

Attn: Sandy Thoms/WSP  
Michelle Medina/WSP

**Re: Limited Geotechnical Evaluation  
SR 303L Litchfield Road Traffic Interchange  
MAG Project No. 0600-0110-17-E003-0780-0K.000008**

Presented herein is our Limited Geotechnical Evaluation for the subject project. This report includes our background review of pertinent geologic and geotechnical data available near the project, as well as present preliminary recommendations for the design and construction of structure and earth-related elements planned.

Please do not hesitate to contact us if you have any questions concerning this report.

Respectfully submitted,  
WSP USA

By:



EXPIRES 12/31/19

Reviewed  
By:

A handwritten signature in black ink, appearing to read "D E Peterson".

Kevin L. Porter, PE  
Senior Geotechnical Engineer

David E. Peterson, PG  
Senior Geologist

cc: Addressee (PDF)

WSP USA  
1230 West Washington Street, Suite 405  
Tempe, AZ 85281

Tel.: +1 480 966 8295  
wsp.com

## TABLE OF CONTENTS

	<b>Page</b>
1.0 INTRODUCTION & PROJECT DESCRIPTION .....	4
2.0 SCOPE OF WORK.....	4
3.0 SITE CONDITIONS .....	5
3.1 Geologic Setting.....	5
3.2 Soil Survey.....	6
3.3 General Geotechnical Profile .....	6
3.3 Groundwater Conditions .....	6
3.4 Site Seismicity .....	6
3.5 Land Subsidence and Earth Fissures.....	7
4.0 DISCUSSION AND RECOMMENDATIONS.....	8
5.0 REFERENCES.....	9

## 1.0 INTRODUCTION & PROJECT DESCRIPTION

The proposed project includes the development of a scoping document, Project Assessment (PA), preliminary construction cost estimate and 15 percent plans for a new traffic interchange to be located on SR 303L at the Litchfield Road alignment near the cities of Surprise and Glendale, Arizona. The new Litchfield Road will be a structure over SR 303L with four different interchange configurations to be evaluated. Ultimately, a preferred configuration will be selected for future design based on the outcome of the scoping document and PA efforts. The location of the project is shown on Figure 1 below.



**Figure 1 – Project Location Map**

## 2.0 SCOPE OF WORK

In support of the PA, this Limited Geotechnical Evaluation of the site was prepared to identify potential geotechnical issues for the project. The evaluation generally included the following:

- Review of published geologic and hydrogeologic literature, relevant reports, record drawings and other readily-available data.
- A preliminary geologic site reconnaissance to observe existing site features.
- Preparation of this preliminary report, presenting the results of our literature review, site observations, and preliminary design considerations.

It is noted that this evaluation is preliminary in nature and is based on an anticipated geotechnical profile from our experience and knowledge of the area and limited surface observations without in-situ subsurface data. It is presented herewith to be used only as a guidance document and general conditions for project development purposes and is not considered a final geotechnical report.

The following record drawings from projects near the site were reviewed for existing geotechnical information as part of this project.

- El Mirage Road TI (303 MA 123 H857601C): Record Drawings, including Foundation Data Sheets.
- SR303L, US 60 – Happy Valley Pkwy (303 MA 120 H689601C): Record Drawings and Geotechnical Roadway, Foundation, and Pavement Reports.

### **3.0 SITE CONDITIONS**

The project site is located northwest of Phoenix near the cities of Surprise and Peoria, in Arizona. SR 303L in the project vicinity is an east-west trending roadway with three general purpose lanes and one HOV lane in each direction of travel separated by median barrier. The project site is generally surrounded by undeveloped desert lands with scattered shallow drainages to the north and residential and commercial developments located to the south. The Beardsley Canal and McMicken Dam Outlet Channel generally run parallel to SR303 along the north side of the project area.

The site lies within the northernmost portion of the West Salt River Valley near the southern foothills of the Hieroglyphic Mountains. Surface waters in the general area typically drain to the south out of the mountains and into the Agua Fria River, which subsequently carries the flows south to the Salt River. In the immediate area of the site the topography is relatively flat in the project vicinity, generally sloping downward to the southeast. Surface flows from the foothills are typically retained upstream of McMicken Dam.

#### **3.1 Geologic Setting**

The project site lies within the Basin and Range Physiographic Province in central Arizona. The Basin and Range typically is characterized by northwest-southeast trending rugged isolated fault-bounded mountain ranges separated by broad alluvium-filled valleys or basins. In the site area, the basin is represented by the West Salt River Valley and the Hieroglyphic Mountains represent the adjacent uplifted mountain highland. The geologic units exposed in the Hieroglyphic Mountains and adjacent foothills include Precambrian to Tertiary bedrock composed of metamorphic rocks, granitic rocks and volcanic assemblages. The basin is typically filled with Tertiary to Quaternary basin-fill sedimentary deposits and locally volcanic flows and tuffs.

The geologic units exposed in the transitional sloping basin floor between the mountains and valley floor include an older alluvial fan deposit locally covered with younger stream channel deposits. The deposits are composed of coarse grained alluvium in the steeper slopes close to the mountains and become finer grained toward the flatter valley floor. The geologic units mapped in the area include the younger Holocene stream channel deposits and Late Tertiary alluvial fan

deposits with Middle Miocene to Oligocene Volcanics (Tv) roughly 2 miles north of the project site. Bedrock is not anticipated to be encountered within the depths of construction at the site.

### **3.2 Soil Survey**

Based on the web soil survey data available from the United States Department of Agriculture (USDA), the surficial site soils are generally composed of Gilman-Antho association and Mohall-Tremant complex, which are generally characterized as loam to clay loam and fine sandy loam, with other minor mapped soil units.

### **3.3 General Geotechnical Profile**

Based on review of available geologic and geotechnical data available near the site, we anticipate the native soils to consist primarily of stratified silty sands and clayey sands with varying amounts of gravel. These soils range from generally loose to medium dense near the ground surface, becoming dense to very dense with depth. The soils are interbedded by sandy clays and sandy silts that are firm to hard with low to medium plasticity and zones of weak cementation. Zones with possible coarse gravel and/or cobbles should also be anticipated.

Existing embankment fills composed of silty to clayey sand and gravel are also present beneath the current SR303 roadway prism. The condition of these fills shall be investigated as part of the final design upon selection of the preferred alternative configuration.

### **3.3 Groundwater Conditions**

The regional depth to groundwater based on historic available well data from the Arizona Department of Water Resources (ADWR), is expected to be deeper than 300 feet below ground. As such, groundwater is not anticipated to be a constraint to design and construction of the planned improvements. Groundwater levels should be expected to vary based on seasonal variations, the locations of nearby drainages, groundwater withdrawal, and other factors. Nearby Groundwater recharge at the Agua Fria Recharge Facility has resulted in local mounding of the groundwater table in the area. However, it is not anticipated to affect the depth to water at the site.

### **3.4 Site Seismicity**

The project seismic AASHTO LRFD criteria were included in this report, in accordance with Section 3.10 of the AASHTO *LRFD Bridge Design Specifications* (2012). The horizontal design acceleration is defined as having a 7 percent chance of exceedance during a 75-year recurrence interval. The probabilistic horizontal spectral acceleration values for the designated return period and corresponding peak horizontal ground acceleration (PGA) were obtained from the United States Geological Survey (USGS) seismic hazards program website (USGS 2013). The values obtained from the website are based on 2009 AASHTO Guide Specifications for LRFD Seismic Bridge Design and use 2002 USGS seismic hazard data.

Based on the assumed soil characteristics at the site, the generally stiff soils are expected to exhibit N-values that typically vary between 15 and 50 blows per foot. As such, in accordance

with AASHTO (2012), the site was classified as Site Class D. The seismic design parameters are presented in

Table 3.1.

**Table 3.1 - Summary of Seismic Design Parameters**

Location	Latitude & Longitude <sup>(1)</sup>	Site Class	Seismic Design Parameter	Period, T (second)	Spectral Acceleration Value, g
SR 303 at Litchfield TI	33.696037°N -112.372841°W	D	A <sub>s</sub>	0.0	0.085
			S <sub>DS</sub>	0.2	0.194
			S <sub>D1</sub>	1.0	0.096

Note: <sup>1</sup> Latitude and longitude of location used to determine seismic design coefficients from USGS website.

### 3.5 Land Subsidence and Earth Fissures

Land subsidence and earth fissures are known to occur in alluvium filled valleys of Arizona where groundwater withdrawal related primarily to agricultural activities has resulted in a decline of the groundwater table. The magnitude of subsidence is directly related to the subsurface geology, the thickness and compressibility of the alluvial sediments deposited in the valleys, and the net groundwater decline.

The majority of the project is not located within an area where significant groundwater withdrawals have occurred in the past, and that known ground subsidence has occurred. However, significant groundwater withdrawals did occur north of the I-10 Freeway in an area referred to as the Luke Basin. Historical groundwater declines have exceeded 300 feet in the central portion of the Luke Basin and the subsidence of the ground surface has been reported to be more than 18 feet (Schumann, 1995). Fissures in the Luke Basin have developed adjacent to exposed bedrock and around the buried topographic highs of the Luke Salt Body, a large salt formation which is known to underlie the area.

We reviewed Synthetic Aperture Radar (InSAR) maps published by the Arizona Department of Water Resources (ADWR), which summarizes changes in ground surface between dates of satellite images for the Phoenix metropolitan area to evaluate evidence of subsidence. The maps include the West Valley Land Subsidence Feature which indicates the northern limits of this feature is near the project site. This feature is increasing in size and based on data between 2010 and 2018, the area has subsided less than about 0.5 inches. Most years of record indicated no subsidence related movement. ADWR well records in the immediate area of the project site are not complete and do not indicate changes in groundwater levels.

A review of published earth fissure maps by The Arizona Geological Survey (AZGS, 2016) did not indicate the presence of any mapped fissures within the project area. The nearest mapped earth fissures are approximately 7 miles south to southwest of the project site.

Given the limited ground subsidence which has been documented at the site (less than 0.5 inches in 8 years) and the distance to any known earth fissures (at least 7 miles), the effects on the planned improvements from land subsidence and earth fissures within the overall project should be negligible in terms of differential movement across the site such that ground subsidence mitigation measures for structures would not be warranted.

#### **4.0 DISCUSSION AND RECOMMENDATIONS**

Preliminary geotechnical engineering considerations regarding the design and construction aspects of this project are presented in the following subsections. The work and materials for construction of the planned improvements should be in accordance with the ADOT Standard Specifications for Road and Bridge Construction (Standard Specifications) and the general recommendations presented in this report, subject to completion of a final geotechnical report. The following sections present our preliminary geotechnical recommendations for the proposed project elements.

Foundations types for walls and bridges are expected to consist of conventional shallow spread footings or drilled shafts sized to support the structural loads. Walls are anticipated to consist of traditional cast-in-place concrete cantilever walls or MSE walls.

Subgrade improvement beneath embankments and retaining structures should be anticipated to limit differential settlement to acceptable levels. Improvement techniques are anticipated to include overexcavation/replacement, lime treatment, geosynthetics, or other suitable improvement techniques. Earthwork factors ranging from 10 to 20 percent shrink are estimated for preliminary purposes.

As noted above, pavements are expected to consist of rigid PCCP or flexible AC designed using appropriate methods and design parameters. For preliminary pavement design, a minimum R-value of 20 may be assumed with the understanding that additional testing will be performed during final design. Subgrade improvement may be necessary beneath pavement sections.

For preliminary estimation purposes, existing pavement sections in the vicinity of the project may be used based on appropriate roadway classifications. Based on review of record drawings, the existing SR303L mainline pavement section is comprised of 13 inches of PCCP over 4 inches of aggregate base (AB). Ramps at El Mirage Road TI consist of 10 inches of PCCP on 4 inches of AB. El Mirage Road consists of 6 inches of asphalt concrete (AC) on 8 inches of AB.

We recommend that a geotechnical exploration and testing program be developed and executed in general accordance with ADOT and/or AASHTO standards to support final design of the planned improvements. In addition, a Pavement Design Summary and Materials Design Report should be developed during final design of the project.

## 5.0 REFERENCES

- American Association of State Highway and Transportation Officials (AASHTO), 2012. *AASHTO LRFD Bridge Design Specifications*. 6th Edition. Washington, DC: American Association of State Highway and Transportation Officials.
- Arizona Department of Transportation (ADOT), 1989. Materials Preliminary Engineering and Design Manual. Revised 1992.
- Arizona Department of Water Resources (ADWR), 2012. Groundwater Site Inventory (GWSI) database <https://gisweb.azwater.gov/waterresourcedata/GWSI.aspx> (Accessed November 2018).
- United States Department of Agriculture (USDA), 2016. Web Soil Survey. Version 3.1. <https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx> (Accessed November 2018).
- United States Geological Survey (USGS), 2013. U.S. Seismic Design Maps. Version 3.1.0. <http://earthquake.usgs.gov/designmaps/us/application.php> (Accessed November 2018).

**APPENDIX H:**  
**Planning and Environmental Linkages (PEL)**  
**Questionnaire and Checklist**

# PEL Planning and Environmental Linkages



## Questionnaire and Checklist



# Planning and Environmental Linkages

## Questionnaire and Checklist



The Planning and Environmental Linkage (PEL) process, a specific product of implementing SAFETEA-LU,<sup>1</sup> seeks to develop subarea and corridor studies that can be used more directly to inform the NEPA<sup>2</sup> process. Effective, conceptual-level transportation planning studies that follow the PEL process provide opportunities both to identify important issues of concern early and to build the agency, stakeholder, and public understanding necessary to successfully address them. Such early, integrated planning is not driven solely by regulatory requirements and the quest for more efficient and effective processes, although those are desirable results. Transportation and environmental professionals—as well as those in metropolitan planning organizations, state and federal resource agencies, and nongovernmental organizations—are finding that early collaboration helps achieve broader transportation and environmental stewardship goals through better decisions regarding programs, planning, and projects.

This document has been developed by the Arizona Department of Transportation (ADOT) to provide guidance, particularly to transportation planners and environmental planners, regarding how to most effectively link the transportation planning and NEPA processes. By considering the questions and issues raised in this questionnaire, transportation planners will become more aware of potential gaps in their subarea or corridor studies, better understand the needs of future users of the studies, and be reminded of the benefits of wider and/or deeper collaboration with agencies, the public, and other stakeholders. Environmental planners who fill out the checklist will assume a new role in the transportation planning process: becoming an advocate for early awareness of environmental issues before the NEPA process begins.

This questionnaire and checklist will be used to effectively influence the scope, content, and process employed for ADOT transportation planning studies that focus on specific transportation corridors or on transportation network subareas (versus statewide transportation studies). Completion of this questionnaire and checklist will support the PEL process and serve dual objectives:<sup>3</sup>

- provide guidance to transportation planners on the level of detail needed to ensure that information collected and decisions made during the transportation planning study can be used during the NEPA process for a proposed transportation project
- provide the future NEPA study team with documentation on the outcomes of the transportation planning process, including the history of decisions made and the level of detailed analysis undertaken

When conducting a transportation planning study that links to the future NEPA process, major issues include:<sup>4</sup>

- identifying the appropriate level of environmental analysis for the study
- identifying the appropriate level of agency, stakeholder, and public involvement
- defining unique study concurrence points for seeking agreement from relevant resource agencies, stakeholders, and members of the public

---

<sup>1</sup> Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (Public Law 109-59)

<sup>2</sup> National Environmental Policy Act of 1969

<sup>3</sup> Objectives are based on the Federal Highway Administration's online document: *Case Studies: Colorado: Colorado Department of Transportation: Tools and Techniques to Implement PEL*, <[www.environment.fhwa.dot.gov/integ/case\\_colorado2.asp](http://www.environment.fhwa.dot.gov/integ/case_colorado2.asp)> (accessed October 24, 2011).

<sup>4</sup> Further guidance is available in the Federal Highway Administration's *Guidance on Using Corridor and Subarea Planning to Inform NEPA*, dated April 5, 2011, available online at <[www.environment.fhwa.dot.gov/integ/corridor\\_nepa\\_guidance.pdf](http://www.environment.fhwa.dot.gov/integ/corridor_nepa_guidance.pdf)>.

- developing a process to ensure that the study will be recognized as valid within the NEPA process
- identifying when to involve resource agencies in the study, and to what extent they influence decision making
- identifying how to persuade U.S. Department of Transportation (USDOT) reviewers to accept the use of these studies in the NEPA process

These issues should be considered throughout the transportation planning study process. Users of this *ADOT Planning and Environmental Linkages Questionnaire and Checklist* should review the entire document at the beginning of the study to familiarize themselves with whatever local and general issues may be operative. The questionnaire is provided in two parts: one to be completed by transportation planners at the beginning of the study and one to be completed at the end. The checklist (Part 3) should be used by environmental planners throughout the study and should be finalized at the end of the study.

Upon completion of the transportation planning study, this document should be included as an appendix to the study's final report to document how the study meets the requirements of 23 Code of Federal Regulations § 450.212 or § 450.318 (Subpart B: Statewide Transportation Planning and Programming or Subpart C: Metropolitan Transportation Planning and Programming, respectively).

The flowchart on the following page outlines the major inputs, decision points, and outcomes that occur during implementation of a transportation planning study using the PEL process.

	Transportation Planners	Both	Environmental Planners
<b>PEL Launch</b>	Review Part 1 and Part 2 of questionnaire Complete Part 1 of questionnaire	Become familiar with local and general issues  Modify study scope to include or deepen analysis of specific resources or environmental issues	Review checklist  Advocate inclusion of resources and issues  Seek resource agency assistance in changing study scope
<b>Analysis and Comment</b>	Define, clarify, analyze, and screen modes, corridors, and alternatives (including no-action alternative)  Involve relevant stakeholders, agencies, and public in comments and reviews to ensure later acceptability and defensibility in NEPA	Become familiar with local and general issues  Modify study scope to include or deepen analysis of specific resources or environmental issues	Continue to advocate addressing collection and analysis of data pertinent to effective application in NEPA process
<b>PEL Completion</b>	Complete Part 2 of questionnaire	Include questionnaire and checklist in appendix to study  Document relevant findings for use in later NEPA documents	Complete checklist (Part 3)



## Beginning of NEPA Process

Environmental planners review completed PEL questionnaire and checklist and confirm that study recommendations and analyses can support the anticipated NEPA process(es) and document type(s), including, if applicable, incorporation into the content of a Notice of Intent

## Questionnaire for Transportation Planners – Part 1

This part of the questionnaire should be completed by transportation planners at the beginning of the transportation planning study. Please note that planners should also review the second part of the questionnaire to understand what additional issues will need to be considered and documented as the study progresses.

Project identification				
<i>What is the name of the study? What cities and region does it cover? What major streets are covered? For corridor studies, what are the intended termini?</i>				
SR 303L, Litchfield Road Traffic Interchange Scoping Document. The project is in Maricopa County, Arizona, near the City of Surprise and the City of Peoria. The major roadways include State Route 303 Loop (SR 303L) at the Litchfield Road alignment.				
<i>Who is the study sponsor?</i>				
Maricopa Association of Governments (MAG) and the City of Surprise				
<i>Briefly describe the study and its purpose.</i>				
A scoping study, PEL, and construction cost estimate for a new traffic interchange (TI) on SR 303L at Litchfield Road. The purpose is to perform a qualitative evaluation of three TI configurations and prepare 15% plans of the selected configuration, along with a scoping document and preliminary cost estimate.				
<i>Who are the primary study team members (include name, title, organization name, and contact information)?</i>				
Name	Title	Organization Name	Phone	Email
Martin Lucero	Transportation Planning Manager	City of Surprise	(623) 222-3142	Martin.lucero@surpriseaz.gov
Suneel Garg	Civil Engineer	City of Surprise	(623) 222-6130	suneel.garg@surpriseaz.gov
Dana Owsiany	Traffic Engineering Manager	City of Surprise	(623) 222-1732	Dana.owsiany@surpriseaz.gov
Karl Zook	Assistant Director/City Engineer	City of Surprise	(623) 222-6140	Karl.zook@surpriseaz.gov
Nuning Lemka	Public Works - Engineering	City of Surprise	(623) 222-6148	Nuning.lemka@surpriseaz.gov
Chaun Hill	Project Manager, Sr. Transportation Engineer	MAG	(602) 254-6300	chill@azmag.gov
Sara Howard	Central Construction District Development	ADOT	(602) 712-6834	showard@azdot.gov
Angie Hardesty	ROW Permit Specialist	FCDMC	(602) 506-5476	alh@mail.maricopa.gov
Bobbie Ohler	Project Manager	FCDMC	(602) 506-2943	bao@mail.maricopa.gov
Chris Lemka	City Traffic Engineer	City of Peoria	(623) 773-7212	Chris.Lemka@peoriaaz.gov
Joy Melita	Project Manager	WSP	(480) 921-6875	Joy.melita@wsp.com
Anthony Scolaro	Environmental	WSP	(480) 449-4939	Anthony.Scolaro@wsp.com
Sandy Thoms	Traffic	WSP	(480) 449-4967	Sandra.Thoms@wsp.com
Michelle Medina	Engineer	WSP	(480) 449-4617	Michelle.Medina@wsp.com
Kevin Porter	Geotechnical	WSP	(480) 449-4933	Kevin.Porter@wsp.com
Angela Galietti	Structures	WSP	(480) 449-4949	Angela.Galietti@wsp.com
<i>Does the team include advisory groups such as a technical advisory committee, steering committee, or other? If so, include roster(s) as attachment(s).</i>				
Not applicable				

ADOT = Arizona Department of Transportation  
 FCDMC = Flood Control District of Maricopa County  
 MAG = Maricopa Association of Governments  
 WSP = WSP, Inc. (Consultant)

<p><i>Have previous transportation planning studies been conducted for this region? If so, provide a brief chronology, including the years the studies were completed. Provide contact names and locations of the studies and study websites.</i></p>	
<p>Several previous studies have been completed in the project area.</p> <ul style="list-style-type: none"> <li>– ADOT SR 303L, US 60 to Happy Valley Parkway Design Concept Report and Environmental Assessment (February 2010). Study and NEPA document to upgrade approximately five miles of SR 303L from a four-lane divided highway to a six-lane access controlled freeway. Contact: Rimpal Shah (ADOT Project Management Group) 602-712-2167. No study website available.</li> <li>– ADOT SR 303L, US 60 to Happy Valley Parkway Preliminary Engineering 30% Design (August 2012). Preliminary design to upgrade approximately five miles of SR 303L from a four-lane divided highway to a six-lane access controlled freeway. Contact: Rimpal Shah (ADOT Project Management Group) 602-712-2167. No study website available.</li> <li>– ADOT Design Memorandum, SR 303L, US 60 to Happy Valley Parkway Additional TI Evaluation (October 2011). Contacts: Rimpal Shah (ADOT Project Management Group) 602-712-2167 and Suneel Garg (City of Surprise) 623-222-6130. No study website available.</li> <li>– Rancho Mercado Unit 1 Development Traffic Impact Analysis (TIA) (2015). Contacts: Dana Owsiany (City of Surprise) 623-222-1732. No study website available.</li> <li>– FCDMC McMicken Channel and various Rancho Mercado CLOMRs/LOMRs (ongoing). Contact: Bobbie Ohler (FCDMC) 602-506-2943. No study website available.</li> </ul>	
<p><i>What current or near-future planning (or other) studies in the vicinity are underway or will be undertaken? What is the relationship of this study to those studies? Provide contact names and locations of the studies and study websites.</i></p>	
<p>No other studies are currently underway or programmed.</p>	
<p><b>Study objectives</b></p>	
<p>What are your desired outcomes for this study? (Mark all that apply.)</p>	
<input checked="" type="checkbox"/> Stakeholder identification <input type="checkbox"/> Stakeholder roles/responsibilities definition <input type="checkbox"/> Travel study area definition <input type="checkbox"/> Performance measures development <input type="checkbox"/> Development of purpose and need goals and other objectives <input checked="" type="checkbox"/> Alternative evaluation and screening <input type="checkbox"/> Alternative travel modes definition	<input checked="" type="checkbox"/> Scheduling of infrastructure improvements over short-, mid-, and long-range time frames <input checked="" type="checkbox"/> Environmental impacts <input type="checkbox"/> Mitigation identification <input type="checkbox"/> Don't know <input type="checkbox"/> Other _____
<p><i>Have system improvements and additions that address your transportation need been identified in a fiscally constrained regional transportation plan?</i></p>	
<p>No.</p>	
<p><i>Will a purpose and need statement<sup>5</sup> be prepared as part of this effort? If so, what steps will need to be taken during the NEPA process to make this a project-level purpose and need statement?</i></p>	
<p>No.</p>	
<p><b>Establishment of organizational relationships</b></p>	
<p><i>Is a partnering agreement in place? If so, who are signatories (for example, affected agencies, stakeholders, organizations)? Attach the partnering agreement(s).</i></p>	
<p>No.</p>	
<p><i>What are the key coordination points in the decision-making process?</i></p>	
<p>Key stakeholder meetings were held to identify scoping needs, select a TI configuration, and finalize scoping documents.</p>	

<sup>5</sup> For an explanation of purpose and need in environmental documents, please see the Federal Highway Administration's (FHWA's) "NEPA and Transportation Decisionmaking: The Importance of Purpose and Need in Environmental Documents," <[Purpose and Need](#)>. This website provides links to five additional resources and guidance from FHWA that should be helpful in understanding the relationship between goals and objectives in transportation planning studies and purpose and need statements of NEPA documents.

<b>Planning assumptions and analytical methods</b>
<i>Is the time horizon of the study sufficiently long to consider long-term (20 years or more from completion of the study) effects of potential scenarios?</i>
The long-term horizon evaluated for this project considered year 2035 traffic volumes, which is sixteen years after completion of the study.
<i>What method will be used for forecasting traffic volumes (for example, traffic modeling or growth projections)? What are the sources of data being used? Has USDOT validated their use?</i>
Forecasted traffic volumes were obtained from the Maricopa Association of Governments' (MAG's) Travel Demand Model (TDM), updated by MAG to incorporate the Litchfield Road TI. The MAG base TDM, based on the conformity model, has been validated by FHWA. The model was modified to add the Litchfield Rd TI and that modified model has not been validated by FHWA.
<i>Will the study use FHWA's Guide on the Consistent Application of Traffic Analysis Tools and Methods<sup>6</sup>? If not, why not? How will traffic volumes from the travel demand model be incorporated, if necessary, into finer-scale applications such as a corridor study?</i>
Yes.
<i>Do the travel demand models base their projections on differentiations between vehicles?</i>
Yes.
<b>Data, information, and tools</b>
<i>Is there a centralized database or website that all State resource agencies may use to share resource data during the study?</i>
No, a centralized database has not been established for this study. Resource agencies are contacted by study team members to obtain the necessary resource data.

<sup>6</sup> FHWA November 2011 publication: <[Traffic Analysis Tools and Methods](#)>

## Questionnaire for Transportation Planners – Part 2

This part of the questionnaire should be completed by transportation planners at the end of the transportation planning study. This completed document should become an appendix to the study's final report to document how the study meets the requirements of 23 Code of Federal Regulations § 450.212 or § 450.318.

Purpose and need for this study
<i>How did the study process define and clarify corridor-level or subarea-level goals (if applicable) that influenced modal infrastructure improvements and/or the range of reasonable alternatives?</i>
The City of Surprise and City of Peoria discussed the need for an additional traffic interchange location with ADOT. A technical analysis was conducted in 2011 to evaluate seven alternative locations for the new interchange, and selected a preferred location. This study defined the corridor-level goals that influenced the range of reasonable alternatives by examining the existing and future conditions of the study area for the previously selected interchange location and evaluating several interchange configuration alternatives.
<i>What were the key steps and coordination points in the decision-making process? Who were the decision-makers and who else participated in those key steps?</i>
The key steps and coordination points for the decision-making process included an outreach process to obtain input from the various stakeholders. Several meetings were held to engage stakeholders (August 2018, October 2018, and February 2019). Stakeholders helped develop criteria for an alternative analysis, met to discuss the results of the alternative evaluation, and ultimately selected the preferred alternative to be carried forward in a scoping document. A Project Assessment was prepared. Stakeholders included MAG, City of Surprise, City of Peoria, MCDOT, FCDMC, and ADOT.
<i>How should this study information be presented in future NEPA document(s), if applicable? Are relevant findings documented in a format and at a level of detail that will facilitate reference to and/or inclusion in subsequent NEPA document(s)?<sup>7</sup></i>
The study findings are documented in a Project Assessment scoping document prepared in adherence to ADOT policies and guidelines. The Project Assessment, in conjunction with the 2011 design memorandum, which evaluated the various TI locations, would form the basis for the future NEPA document. The likely NEPA document would be a Categorical Exclusion.
<i>Were the study's findings and recommendations documented in such a way as to facilitate an FHWA or Federal Transit Administration decision regarding acceptability for application in the NEPA process? Does the study have logical points where decisions were made and where concurrence from resource or regulatory agencies, stakeholders, and the public was sought? If so, provide a list of those points.</i>
Yes; the findings have been documented in such a way as to facilitate a FHWA decision regarding acceptability for application in the final NEPA process. The study findings are documented in a Project Assessment scoping document prepared in adherence to ADOT policies and guidelines. Stakeholder input has been documented in meeting minutes. Regulatory and resource agency input will need to be obtained during final design in preparation of the future NEPA document.

<sup>7</sup> For an explanation of the types of documents needed under the NEPA process and the nature of the content of those documents, please see "NEPA Documentation: Improving the Quality of Environmental Documents," <[Documentation](#)>.

<b>Establishment of organizational relationships – tribes and agencies<sup>8</sup></b>			
<b>Tribe or agency</b>	<b>Date(s) contacted</b>	<b>Describe level of participation</b>	<b>Describe the agency's primary concerns and the steps needed to coordinate with the agency during NEPA scoping.<sup>9</sup></b>
<b><i>Tribal</i></b>			
None			
<b><i>Federal</i></b>			
None			
<b><i>State</i></b>			
Arizona Department of Transportation		Alternative Selection, Scoping	Alternatives development, freeway system impacts
<b><i>County</i></b>			
Maricopa County Department of Transportation		Alternative Selection, Scoping	Alternatives development, ROW acquisition
Flood Control District of Maricopa County		Alternative Selection, Scoping	Impacts to nearby facilities
<b><i>Local</i></b>			
City of Surprise		Alternative Selection, Scoping, ongoing communication during project development	Alternatives development, traffic impacts
City of Peoria		Alternative Selection, Scoping	Alternatives development, traffic impacts
<b><i>Transportation agencies</i></b>			
Maricopa Association of Governments		Alternative Selection, Scoping, ongoing communication during project development	Alternatives development, project funding

<sup>8</sup> Users may add rows to this table to accommodate additional tribes and agencies. Unused rows may be deleted.

<sup>9</sup> If the transportation planning study final report does not adequately document interactions (for example, meeting minutes, resolutions, letters) with the relevant agencies, append such information to the end of this questionnaire and checklist.

Establishment of organizational relationships – stakeholders and members of the public <sup>10</sup>			
Public and stakeholders	Date(s) contacted	Describe level of participation	Describe the primary concerns expressed by members of the public and stakeholders.
<b>Public</b>			
None			
<b>Stakeholders</b>			
None			

Planning assumptions and analytical methods
<i>Did the study provide regional development and growth assumptions and analyses? If so, what were the sources of the demographic and employment trends and forecasts?</i>
Yes. The MAG TDM uses regionally-accepted demographic and employment forecasts and was utilized in developing the growth projections for this project.
<i>What were the future-year policy and/or data assumptions used in the transportation planning process related to land use, economic development, transportation costs, and network expansion?</i>
For the 2035 planning year, land use south of SR 303L is not expected to change substantially as the area is primarily established. Future development is envisioned in currently open areas north of SR 303L. Economic benefits will be derived from new development and an expanded transportation network. The additional access point to SR 303L will provide much-needed congestion relief from the Happy Valley Rd TI and the US 60 TI, as well as the roadway network on the north side of SR 303L in the 6.5 miles between the two interchanges. The new TI is expected to address access needs from expansion in the area.
<i>Were the planning assumptions and the corridor vision/purpose and need statement consistent with each other and with the long-range transportation plan? Are the assumptions still valid?</i>
Yes.
Data, information, and tools
<i>Are the relevant data used in the study available in a compatible format that is readily usable? Are they available through a centralized web portal?</i>
Yes, the data is available in the Project Assessment scoping document. It is not available through a centralized web portal.
<i>Are the completeness and quality of the data consistent with the quality (not scale or detail) of inputs needed for a NEPA project-level analysis<sup>11</sup>?</i>
Yes.
<i>Are the data used in the study regularly updated and augmented? If regularly updated, provide schedule and accessibility information.</i>
No. The data will need to be updated when the future NEPA document is prepared.
<i>Have the environmental data been mapped at scales that facilitate comparison of effects across different resources and at sufficient resolution to guide initial NEPA issue definition? If not, what data collection and/or manipulation would likely be needed for application to the NEPA scoping process?</i>
No. Additional data collection and associated mapping are needed for application to the NEPA scoping process.

<sup>10</sup> Users may add rows to this table to accommodate additional stakeholders.

<sup>11</sup> For an explanation of the types of information needed to evaluate impacts in environmental documents, please see FHWA's "NEPA and Transportation Decisionmaking: Impacts," <[Analysis of Impacts](#)>. This website provides links to six additional resources and guidance that should be helpful in understanding the types of impacts that need to be assessed, their context, and their intensity.

Examine the Checklist for Environmental Planners, at the back of this document, for more detail about potential impacts that could be mapped. Below is an abbreviated list of resources that could occur in the study area and may be knowable at this time and at the study's various analytical scales:

Resource or issue	Is the resource or issue present in the area?	Would any future transportation policies or projects involve the issue? Would there be impacts on the resource?
Sensitive biological resources	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Not applicable
Wildlife corridors	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable
Wetland areas	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Not applicable
Riparian areas	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable
100-year floodplain	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Not applicable
Prime or unique farmland or farmland of statewide or local importance	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable
Visual resources	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable
Designated scenic road/byway	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable
Archaeological resources	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Not applicable
Historical resources	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable

Resource or issue	Is the resource or issue present in the area?	Would any future transportation policies or projects involve the issue? Would there be impacts on the resource?
Section 4(f) <sup>12</sup> wildlife and/or waterfowl refuge, historic site, recreational site, park	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable
Section 6(f) <sup>13</sup> resource	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable
Existing development	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable
Planned development	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable
Title VI/ Environmental justice populations <sup>14</sup>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable
Utilities	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable
Hazardous materials	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Not applicable
Sensitive noise receivers <sup>15</sup>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable
Air quality	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable
Other (list) _____	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable

<sup>12</sup> Section 4(f) of the U.S. Department of Transportation Act of 1966 (49 U.S. Code § 303, as amended); see <[Section 4\(f\)](#)>.

<sup>13</sup> Section 6(f) of the Land and Water Conservation Fund Act

<sup>14</sup> refers to Title VI of the 1964 Civil Rights Act and 1994 Executive Order 12898 on environmental justice

<p><i>Did the study incorporate models of, for example, species/habitat locations (predictive range maps), future land use, population dynamics, stormwater runoff, or travel demand? What models were used? Did the study adequately document what models were used, who was responsible for their use, and how they were used (with respect to, for example, calibration, replicability, contingencies, and exogenous factors)?</i></p>
<p>The MAG TDM and population dynamics were used in the evaluation of the Project Assessment, which documents how they were used by the consultant.</p>
<p><i>In scoping, conducting, and documenting the planning study, participants have come across documents and leads from agency staff and other sources that the environmental planners may be able to use in conducting their studies. List any applicable memoranda of understanding, cost-share arrangements, programmatic agreements, or technical studies that are underway but whose findings are not yet published, etc.</i></p>
<p>Not applicable</p>
<p><b>Development of alternatives</b></p>
<p><i>Were resource agencies, stakeholders, and members of the public engaged in the process of identifying, evaluating, and screening out modes, corridors, a range of alternatives,<sup>16</sup> or a preferred alternative (if one was identified—the latter two refer to corridor plans)? If so, how? Did these groups review the recommendation of a preferred mode(s), corridor(s), range of alternatives (including the no-build alternative), or an alternative? Were the participation and inputs of these groups at a level acceptable for use in purpose and need statements or alternatives development sections in NEPA documents? If not, why not?</i></p>
<p>Agencies and stakeholders participated in all key project decisions. Consensus on decisions were reached at several meetings (August 2018, October 2018, and February 2019). Agencies/stakeholders helped develop criteria for an alternative analysis, met to discuss the results of the alternative evaluation, and ultimately selected the recommended alternative to be carried forward in a scoping document. The level of participation by agencies/stakeholders was acceptable for use in NEPA documentation.</p>
<p><i>Describe the process of outreach to resource agencies, the public, and other stakeholders. Describe the documentation of this process and of the responses to their comments. Is this documentation adequate in breadth and detail for use in NEPA documents?</i></p>
<p>The outreach process involved inviting agencies/stakeholders to study meetings, conducting the meetings in a way that solicited input and decision, and documenting the meeting discussions/decisions. This documentation is acceptable for use in the future NEPA document.</p>
<p><i>If the study was a corridor study, describe the range of alternatives considered (if any), screening process, and screening criteria. Include what types of alternatives were considered (including the no-build alternative) and how the screening criteria were selected. Was a preferred alternative selected as best addressing the identified transportation issue? Are alternatives' locations and design features specified?</i></p>
<p>Not a corridor study.</p>
<p><i>Also regarding whether the study was a corridor study, for alternatives that were screened out, summarize the reasons for their rejection. Are defensible, credible rationale articulated for their being screened out? Did the study team take into account legal standards<sup>17</sup> needed in the NEPA process for such decisions? Did the study team have adequate information for screening out the alternatives?</i></p>
<p>Not a corridor study.</p>
<p><i>What issues, if any, remain unresolved with the public, stakeholders, and/or resource agencies?</i></p>
<p>No design or construction funding source has been identified.</p>

<sup>15</sup> under FHWA's Noise Abatement Criterion B: picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals

<sup>16</sup> For an explanation of the development of alternatives in environmental documents, please see FHWA's "NEPA and Transportation Decisionmaking: Development and Evaluation of Alternatives," <[Alternatives](#)>.

<sup>17</sup> 23 Code of Federal Regulations (CFR) § 771.123(c), 23 CFR § 771.111(d), 40 CFR § 1502.14(a), 40 CFR § 1502.14(b) and (d), 23 CFR § 771.125(a)(1); see FHWA Technical Advisory T 6640.8A, October 30, 1987, <[FHWA Technical Advisory T 6640.8A](#)>.

**Formally joining PEL with the NEPA process**

*Lead federal agencies proposing a project that will undergo the NEPA process will want to most effectively leverage the transportation planning study's efforts and results. How could a Notice of Intent (for an environmental impact statement<sup>18</sup>) refer to the study's findings with respect to preliminary purpose and need and/or the range of alternatives to be studied?*

Not an EIS.

*Could a Notice of Intent in the NEPA process clearly state that the lead federal agency or agencies will use analyses from prior, specific planning studies that are referenced in the transportation planning study final report? Does the report provide the name and source of the planning studies and explain where the studies are publicly available? If not, how could such relevant information come to the environmental planners' attention and be made available to them in a timely way?*

Not an EIS.

*List how the study's proposed transportation system would support adopted land use plans and growth objectives.*

Provide alternative access to existing and planned development in the northwest area of Maricopa County. The existing TIs connecting the north side of SR 303L to the freeway are 6.5 miles apart, which limits access and contributes to congestion on the regional transportation network.

*What modifications are needed in the goals and objectives as defined in the transportation study process to increase their efficient and timely application in the NEPA process?*

No modifications are needed.

*Jurisdictional delineations of waters of the United States frequently change. Housing and commercial developments can alter landscapes dramatically and can be constructed quickly. Noise and air quality regulations can change relatively rapidly. Resource agencies frequently alter habitat delineations to protect sensitive species. Will the study data's currency, relevance, and quality still be acceptable to agencies, stakeholders, and members of the public for use in the NEPA process? If not, what will be done to rectify this problem? Who will be responsible for any needed updating?*

Yes. Project is anticipated to move into design and construction relatively quickly.

Yes, the study data's currency, relevance, and quality, as documented in the Project Assessment, will be acceptable to agencies, stakeholders and the public for use in starting the future NEPA document. Because changes are common, the agency (or their supporting consultant) will update data, as necessary, to accurately describe existing conditions when the future NEPA document is prepared.

**Other issues**

Are there any other issues a future NEPA study team should be aware of (mark all that apply)? In the space below the check boxes, explain the nature and location of any issue(s) checked.

- ☐ Public and/or stakeholders have expressed specific concerns  
☐ Utility problems  
☒ Access or right-of-way issues  
☐ Encroachments into right-of-way  
☒ Need to engage—and be perceived as engaging—specific landowners, citizens, citizen groups, or other stakeholders

- ☐ Contact information for stakeholders  
☐ Special or unique resources in the area  
☐ Federal regulations that are undergoing initial promulgation or revision  
☐ Other \_\_\_\_\_

New right-of-way will need to be acquired for this project. MCDOT currently owns the land to be acquired and they have expressed interest in selling the land.

No public outreach has occurred during the development of the Project Assessment.

<sup>18</sup> While Notices of Intent are required by some federal agencies for environmental assessments, they are optional for FHWA. Please see “3.3.2 Using the Notice of Intent to Link Planning and NEPA,” in *Guidance on Using Corridor and Subarea Planning to Inform NEPA* (Federal Highway Administration, April 5, 2011), <[Notice of Intent](#)>.

**Concurrence**

By signature, we concur that the transportation planning document meets or exceeds the following criteria in terms of acceptability for application in NEPA projects:

- ☐ Public involvement (outreach and level of participation)
- ☐ Stakeholder involvement (outreach and level of participation)
- ☐ Resource agencies' involvement and participation
- ☐ Documentation of the above efforts
- ☒ Applicability of the general findings and conclusions for use, by reference, in NEPA documents

Approved by: \_\_\_\_\_ Date: \_\_\_\_\_

DALLAS HAMMIT

State Engineer

Arizona Department of Transportation

Approved by: \_\_\_\_\_ Date: \_\_\_\_\_

GREGORY D. BYRES

Director

Multimodal Planning Division, Arizona Department of Transportation

Approved by: \_\_\_\_\_ Date: \_\_\_\_\_

KARLA S. PETTY

Division Administrator

Federal Highway Administration

## Checklist for Environmental Planners – Part 3

By completing this checklist, environmental planners will be able to systematically evaluate the transportation planning study with regard to environmental resources and issues. It provides a framework for future NEPA studies by identifying those resources and issues that have already been evaluated, and those that have not. The role of environmental planners during the study's various stages is laid out in the flowchart on page 3. This role includes timely advocacy for resources and issues that will later be integral to NEPA processes.

### Checklist for environmental planners

Resource or issue	Is the resource or issue present in the area?	Are impacts to the resource or issue involvement possible?	Are the impacts mitigable?	Discuss the level of review and method of review for this resource or issue and provide the name and location of any study or other information cited in the planning document where it is described in detail. Describe how the planning data may need to be supplemented during NEPA.
<b>Natural environment</b>				
Sensitive biological resources	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	Arizona Game & Fish Department (AGFD), Arizona Environmental Online Review Tool Report (11/29/2018); AGFD, HabiMap ( <a href="http://www.habimap.org/habimap/">http://www.habimap.org/habimap/</a> ); US Fish & Wildlife Service (USFWS), Critical Habitat Map Viewer ( <a href="https://fws.maps.arcgis.com/home/webmap/viewer.html?webmap=9d8de5e265ad4fe09893cf75b8dbfb77">https://fws.maps.arcgis.com/home/webmap/viewer.html?webmap=9d8de5e265ad4fe09893cf75b8dbfb77</a> ). Sensitive biological resources are not known to occur in the project area. A biological evaluation would be completed during the NEPA process to determine the presence of and potential impact on biological resources.
Wildlife corridors	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input checked="" type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input checked="" type="checkbox"/> Not applicable	ADOT, Arizona's Wildlife Linkages Map ( <a href="https://www.azdot.gov/business/environmental-planning/programs/wildlife-linkages/">https://www.azdot.gov/business/environmental-planning/programs/wildlife-linkages/</a> ); AGFD, Wildlife & Habitat Connectivity ( <a href="https://www.azgfd.com/wildlife/planning/habitatconnectivity/identifying-corridors/">https://www.azgfd.com/wildlife/planning/habitatconnectivity/identifying-corridors/</a> )
Invasive species	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	US Department of Agriculture (USDA), National Invasive Species Information Center ( <a href="https://www.invasivespeciesinfo.gov/us/arizona">https://www.invasivespeciesinfo.gov/us/arizona</a> ). Invasive species present would be identified in the biological evaluation during the NEPA process.
Wetland areas	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input checked="" type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input checked="" type="checkbox"/> Not applicable	USFWS, National Wetland Inventory ( <a href="https://www.fws.gov/wetlands/Data/Mapper.html">https://www.fws.gov/wetlands/Data/Mapper.html</a> )
Riparian areas	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input checked="" type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input checked="" type="checkbox"/> Not applicable	US Environmental Protection Agency (EPA), WATERS Geo Viewer ( <a href="https://www.epa.gov/waterdata/waters-geoviewer">https://www.epa.gov/waterdata/waters-geoviewer</a> ) USFWS, National Wetland Inventory ( <a href="https://www.fws.gov/wetlands/Data/Mapper.html">https://www.fws.gov/wetlands/Data/Mapper.html</a> ) AGFD, HabiMap ( <a href="http://www.habimap.org/habimap/">http://www.habimap.org/habimap/</a> )

## Checklist for environmental planners

Resource or issue	Is the resource or issue present in the area?	Are impacts to the resource or issue involvement possible?	Are the impacts mitigable?	Discuss the level of review and method of review for this resource or issue and provide the name and location of any study or other information cited in the planning document where it is described in detail. Describe how the planning data may need to be supplemented during NEPA.
100-year floodplain	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input checked="" type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input checked="" type="checkbox"/> Not applicable	Flood Insurance Rate Map 04013C1230L, effective 10/16/2013 (Federal Emergency Management Agency, October 2017)
Clean Water Act Sections 404/401 waters of the United States	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input checked="" type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input checked="" type="checkbox"/> Not applicable	US EPA, WATERS Geo Viewer ( <a href="https://www.epa.gov/waterdata/waters-geoviewer">https://www.epa.gov/waterdata/waters-geoviewer</a> )
Prime or unique farmland	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input checked="" type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input checked="" type="checkbox"/> Not applicable	USDA, Natural Resources Conservation Service, Web Soil Survey ( <a href="https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx">https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx</a> )
Farmland of statewide or local importance	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input checked="" type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input checked="" type="checkbox"/> Not applicable	USDA, Natural Resources Conservation Service, Web Soil Survey ( <a href="https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx">https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx</a> )
Sole-source aquifers	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input checked="" type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input checked="" type="checkbox"/> Not applicable	US EPA, Pacific Southwest, Region 9 ( <a href="https://archive.epa.gov/region9/water/archive/web/pdf/upper-santa-cruz-avra-basin-ssa-map.pdf">https://archive.epa.gov/region9/water/archive/web/pdf/upper-santa-cruz-avra-basin-ssa-map.pdf</a> )
Wild and scenic rivers	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input checked="" type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input checked="" type="checkbox"/> Not applicable	National Wild and Scenic Rivers System ( <a href="https://www.rivers.gov/arizona.php">https://www.rivers.gov/arizona.php</a> )
Visual resources	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input checked="" type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input checked="" type="checkbox"/> Not applicable	Project site visit and vicinity photographs
Designated scenic road/byway	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input checked="" type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input checked="" type="checkbox"/> Not applicable	Federal Highway Administration ( <a href="https://www.fhwa.dot.gov/byways/states/AZ">https://www.fhwa.dot.gov/byways/states/AZ</a> ); ADOT ( <a href="https://www.azdot.gov/about/historic-roads/scenic-roads/types-of-scenic-roads/state-designations">https://www.azdot.gov/about/historic-roads/scenic-roads/types-of-scenic-roads/state-designations</a> )
<b>Cultural resources</b>				
Archaeological resources	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	A Class I Cultural Resources Inventory of Approximately 56.32 Acres along the Litchfield Road Alignment, from SR 303L to McMicken Dam, Maricopa County, Arizona (SWCA 2019)
Historical resources	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	A Class I Cultural Resources Inventory of Approximately 56.32 Acres along the Litchfield Road Alignment, from SR 303L to McMicken Dam, Maricopa County, Arizona (SWCA 2019)
<b>Section 4(f) and Section 6(f) resources</b>				
Section 4(f) wildlife and/or waterfowl refuge	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input checked="" type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input checked="" type="checkbox"/> Not applicable	USFWS ( <a href="https://www.fws.gov/refuges/refugeLocatorMaps/Arizona.html">https://www.fws.gov/refuges/refugeLocatorMaps/Arizona.html</a> ); AFGD ( <a href="https://www.azgfd.com/wildlife/viewing/wheretog/phenixandcentral/">https://www.azgfd.com/wildlife/viewing/wheretog/phenixandcentral/</a> )

## Checklist for environmental planners

Resource or issue	Is the resource or issue present in the area?	Are impacts to the resource or issue involvement possible?	Are the impacts mitigable?	Discuss the level of review and method of review for this resource or issue and provide the name and location of any study or other information cited in the planning document where it is described in detail. Describe how the planning data may need to be supplemented during NEPA.
Section 4(f) historic site	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	A Class I Cultural Resources Inventory of Approximately 56.32 Acres along the Litchfield Road Alignment, from SR 303L to McMicken Dam, Maricopa County, Arizona (SWCA 2019). Dependent on Section 106 findings.
Section 4(f) recreational site	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input checked="" type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input checked="" type="checkbox"/> Not applicable	City of Surprise <a href="https://www.surpriseaz.gov/229/Parks-Facilities">https://www.surpriseaz.gov/229/Parks-Facilities</a> ; City of Peoria <a href="https://www.peoriaaz.gov/government/departments/parks-recreation-and-community-facilities/parks-and-trails/parks-map">https://www.peoriaaz.gov/government/departments/parks-recreation-and-community-facilities/parks-and-trails/parks-map</a> ; Maricopa County <a href="https://www.maricopacountyparks.net/park-locator/">https://www.maricopacountyparks.net/park-locator/</a> ; Arizona State Parks & Trails <a href="https://azstateparks.com/find-a-park/">https://azstateparks.com/find-a-park/</a>
Section 4(f) park	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input checked="" type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input checked="" type="checkbox"/> Not applicable	City of Surprise <a href="https://www.surpriseaz.gov/229/Parks-Facilities">https://www.surpriseaz.gov/229/Parks-Facilities</a> ; City of Peoria <a href="https://www.peoriaaz.gov/government/departments/parks-recreation-and-community-facilities/parks-and-trails/parks-map">https://www.peoriaaz.gov/government/departments/parks-recreation-and-community-facilities/parks-and-trails/parks-map</a> ; Maricopa County <a href="https://www.maricopacountyparks.net/park-locator/">https://www.maricopacountyparks.net/park-locator/</a> ; Arizona State Parks & Trails <a href="https://azstateparks.com/find-a-park/">https://azstateparks.com/find-a-park/</a>
Section 6(f) resource	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input checked="" type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input checked="" type="checkbox"/> Not applicable	City of Surprise <a href="https://www.surpriseaz.gov/229/Parks-Facilities">https://www.surpriseaz.gov/229/Parks-Facilities</a> ; City of Peoria <a href="https://www.peoriaaz.gov/government/departments/parks-recreation-and-community-facilities/parks-and-trails/parks-map">https://www.peoriaaz.gov/government/departments/parks-recreation-and-community-facilities/parks-and-trails/parks-map</a> ; Maricopa County <a href="https://www.maricopacountyparks.net/park-locator/">https://www.maricopacountyparks.net/park-locator/</a> ; Arizona State Parks & Trails <a href="https://azstateparks.com/find-a-park/">https://azstateparks.com/find-a-park/</a>
<b>Human environment</b>				
Existing development	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	Google Maps <a href="https://www.google.com/maps/place/Arizona+State+Rte+303">https://www.google.com/maps/place/Arizona+State+Rte+303</a> . Consideration of potential indirect and cumulative impacts from any likely induced development would be included in the NEPA process.

## Checklist for environmental planners

Resource or issue	Is the resource or issue present in the area?	Are impacts to the resource or issue involvement possible?	Are the impacts mitigable?	Discuss the level of review and method of review for this resource or issue and provide the name and location of any study or other information cited in the planning document where it is described in detail. Describe how the planning data may need to be supplemented during NEPA.
Planned development	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	City of Surprise Long Range Planning ( <a href="https://www.surpriseaz.gov/1172/Long-Range-Planning">https://www.surpriseaz.gov/1172/Long-Range-Planning</a> ); City of Peoria General Plan ( <a href="https://www.peoriaaz.gov/home/showdocument?id=3790">https://www.peoriaaz.gov/home/showdocument?id=3790</a> ). Consideration of potential indirect and cumulative impacts from any likely induced development would be included in the NEPA process.
Displacements	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input checked="" type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input checked="" type="checkbox"/> Not applicable	Google Maps (same site viewed for Existing development above).
Access restriction	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input checked="" type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input checked="" type="checkbox"/> Not applicable	Google Maps (same site viewed for Existing development above).
Neighborhood continuity	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input checked="" type="checkbox"/> Not applicable	Google Maps (same site viewed for Existing development above). A residential neighborhood lies to the south of the project but would not be encroached on by the project.
Community cohesion	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input checked="" type="checkbox"/> Not applicable	Google Maps (same site viewed for Existing development above). No known community cohesion issues are present; however, the proposed project would not divide or disrupt any existing communities.
Title VI/Environmental justice populations	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input checked="" type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input checked="" type="checkbox"/> Not applicable	US Census Bureau, American Community Survey, 2013-2017 5-year estimates (December 2018) <a href="https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml">https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml</a>
<b>Physical environment</b>				
Utilities	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	Arizona Blue Stake 811 ( <a href="http://www.azbluestake.com/">http://www.azbluestake.com/</a> ) Ten public and private entities have utilities in the project area that may require relocation.
Hazardous materials	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	Arizona Department of Environmental Quality ( <a href="http://gisweb.azdeq.gov/arcgis/emaps/">http://gisweb.azdeq.gov/arcgis/emaps/</a> ). A preliminary initial site assessment would be completed during the NEPA process to determine the presence of hazardous materials and if there is any potential for contamination.
Sensitive noise receivers	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	Google Maps (same site viewed for Existing development above). A residential neighborhood lies to the south of the project. A traffic noise study would be completed during the NEPA process to determine impacts and mitigation.

## Checklist for environmental planners

Resource or issue	Is the resource or issue present in the area?	Are impacts to the resource or issue involvement possible?	Are the impacts mitigable?	Discuss the level of review and method of review for this resource or issue and provide the name and location of any study or other information cited in the planning document where it is described in detail. Describe how the planning data may need to be supplemented during NEPA.
Air quality	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	ADOT ( <a href="https://azdot.gov/docs/default-source/environmental-planning-library/az-mpo-cogs-and-na-area.pdf?sfvrsn=2">https://azdot.gov/docs/default-source/environmental-planning-library/az-mpo-cogs-and-na-area.pdf?sfvrsn=2</a> ). The project lies within a nonattainment and maintenance area. ADOT's <a href="#">NEPA Air Quality Screening Checklist</a> will determine the level of analysis necessary during the NEPA process.
Other (list)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	

Identification of potential environmental mitigation activities
<p><i>Could the transportation planning process be integrated with other planning activities, such as land use or resource management plans? If so, could this integrated planning effort be used to develop a more strategic approach to environmental mitigation measures?</i></p> <p>Possible integration with future Litchfield Road extension to the north. Integrated planning is not likely to affect mitigation required for this proposed project.</p>
<p><i>With respect to potential environmental mitigation opportunities at the PEL level, who should ADOT consult with among federal, State, and local agencies and tribes and how formally and frequently should such consultation be undertaken?</i></p> <p>ADOT should continue to consult with local jurisdictions (Surprise, Peoria) as the project moves into further design stages. No mitigation needs present themselves at this stage that would require consultation with additional regulatory agencies or stakeholders.</p>
<p><i>Off-site and compensatory mitigation areas are often creatively negotiated to advance multiagency objectives or multiple objectives within one agency. Who determined what specific geographic areas or types of areas were appropriate for environmental mitigation activities? How were these determinations made?</i></p> <p>No mitigation needs presented themselves at this stage that required consideration of off-site compensatory and mitigation areas.</p>
<p><i>To address potential impacts on the human environment, what mitigation measures or activities were considered and how were they developed and documented?</i></p> <p>Potential impacts at this stage consist of potential traffic noise. A noise analysis would be designed and implemented at a future design stage.</p>

Prepared by: Anthony J. Scolaro Date: January 24, 2019

Anthony J. Scolaro, AICP CEP  
 Senior Supervising Environmental Planner  
 WSP